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Additions to the Wild Fauna and Flora of the Royal Botanic Gardens, Kew: XXIV*

(Edited by H. K. Airy Shaw)

The records in the present Supplement cover in general the period 1952–1960. As on previous occasions, we are greatly indebted to members of the staff of the British Museum (Natural History) for many determinations; they are individually acknowledged under each item. We would also express our thanks to Mr. J. F. Peake, who has kindly acted as 'courier' for material between Kew and South Kensington on many occasions. We are very grateful to Mr. K. A. Spencer, of Hampstead, for his valuable contribution on the leaf-mining Dipterous family *Agromyzidae* (pp. 185-188), on which he is a world authority. Special thanks are due to Messrs. J. H. Hemsley (*J.H.H.*), E. Milne-Redhead (*E.M.-R.*) and J. E. S. Souster (*J.S.*), and Dr. J. W. Landells (*J.W.L.*), for their work in the preparation of the bird records. Mr. J. L. Gilbert (*J.L.G.*) has been indefatigable in collecting material of some of the less conspicuous organisms—notably *Collembola* and *Lichenes*.

In the present Supplement a change is made in the use of asterisks (*) in order to conform with more general practice. An asterisk prefixed to a record now signifies *believed first record for the Gardens or immediate vicinity*; whilst a dagger (†) denotes known or supposed *accidentally introduced species*. As in previous supplements, square brackets [ ] enclose records from just outside the Gardens, and also page references to earlier records in the original 'Wild Fauna and Flora' (1906) [F.] and subsequent Supplements [I, II, etc.].

* Continued from Kew Bull. 13: 301 (1958). Supplement XXIII was inadvertently numbered 'XXII'.

FAUNA

Vertebrata

MAMMALIA

CHIROPTERA

VESPERTILIONIDAE

Nyctalus noctula (*Schreb.*). NOCTULE. On suitable summer evenings a flight of noctules is to be seen feeding between the western end of the Lake and the River. On one or two occasions it was estimated that over 30 bats were present. As no roosting place has been located in the Gardens, it is thought that these bats may roost in Syon Park. This identification has been made by Mr. Michael Blackmore.—*E.M.-R.* [F. 2.]

CARNIVORA

CANIDAE

Vulpes v. crucigera (*Bechst.*). FOX. A fox was reported entering the Gardens from the Old Deer Park at night and taking waterfowl, iv.1959.—*E.M.-R.* [F.1.]

MUSTELIDAE

Meles meles (*L.*). BADGER. At least one was present in the Arboretum during the winters of 1958–9 and 1959–60. A sett was excavated in a clump of rhododendrons in the Cedar Vista in 1958–9. [XVIII.60, 1936.]

PHOCIDAE

*[**Phoca vitulina** *L.* COMMON SEAL. One swimming up the River near the Kew bank by the Syon Gate, 8.xi.1953.—*E.M.-R.*]

RODENTIA

LEPORIDAE

Oryctolagus cuniculus (*L.*). RABBIT. We regret to note that rabbits are now re-established in the Gardens. [F.1].

AVES

(arranged by Wetmore system)

PODICIPITIDAE

Podiceps cristatus (*L.*). GREAT CRESTED GREBE. Two were seen on the Pond for a few days, iii.1953. [XVIII.62, 1936.]

P. ruficollis (*Pall.*). LITTLE GREBE or DABCHICK. Still breeds regularly on the Lake, and is present all the year round. [F.10; XXI.232, 1949.]

PHALACROCORACIDAE

Phalacrocorax carbo (*L.*). CORMORANT. [Frequent on the River and on the Syon Park tree-roost]. Seen flying over the Gardens occasionally. [XVIII.61, and 63, under 'Shag', 1936.]

***†P. aristotelia** (*L.*). Shag. In the latter part of March 1960, a Shag arrived in the Gardens under rather unusual circumstances. We are indebted to Miss Susan Carter for the following eye-witness account of the first part of the story.

'On Wednesday evening, 23rd March, at 5.40 p.m., I arrived at the bus-stop on Kew Bridge to wait for a bus to Hammersmith. I was the only person there, and had been waiting for three or four minutes, when I suddenly became aware of a fairly large, black bird flying along the centre of the road, from the Chiswick side of the bridge, and about 15 feet above it. I thought it was a cormorant, so frightened by the traffic that it couldn't find its way over the parapet of the bridge to the river below. It was flying quite normally, and did not appear to be at all injured. Much to my alarm, it flew lower, and landed, with a slight skid, in the middle of the road, exactly by the stop on Kew Green for buses going into Richmond. The traffic all came to a halt, while the bird stood there with its long neck outstretched and its head cocked to one side. Then it started to walk between the cars, but I saw a man on a motor-cycle get off (there was no one at the bus-stop) and stoop down, evidently to pick the bird up. At that moment my bus arrived, so I couldn't stay to see the sequel.'

This Shag was taken by the motor-cyclist to Mr. J. H. Claiden, the Bird Keeper. It was found to be undamaged, and was let loose on the Pond. It soon became quite at home, flew freely, swam and dived for fish, sometimes among the Tufted Duck (*Aythya fuligula*) which were being fed by visitors. At times it stood on the bank within about 6 yards of onlookers. It was last seen on 30th March.—*E.M.-R.*

[The record in XVIII.63, 1936, is almost certainly erroneous, and refers to the Cormorant, for which a separate record actually appears in XVIII. 61.]

Ardeidae

Ardea cinerea *L.* Heron. Often seen in the Gardens early and late in the day. Seen fishing in the Pond on several occasions in 1958 and 1959.—*E.M.-R. & J.S.* [F.8].

Anatidae

Anas platyrhynchos *L.* Mallard. 121 birds counted in Gardens, 14.xii.1958.—*J.S.* [F.9].

***A. crecca** *L.* Teal. 8 pairs sheltering by the islands on the Lake, 23.i.1954.—*J.H.H.*

***A. strepera** *L.* Gadwall. One ♂ on half-frozen Lake with a ♂ Pintail, 25.i.1958.—*J.W.L.*

***A. penelope** *L.* Wigeon. One ♂ on Pond, 9.iii.1958.—*J.S.*

***A. acuta** *L.* Pintail. [A pair on River, 9.iii.1958.—*J.S.*] One ♂ on half-frozen Lake, with a ♂ Gadwall, 25.i.1958.—*J.W.L.*

***Spatula clypeata** (*L.*). Shoveler. One ♂ on Lake, 9.iii.1953; one ♂ near NE. end of Lake, dabbling in mud, 10.iii.1958.—*J.S.*

***Aythya fuligula** (*L.*). Tufted Duck. Common in the Gardens, and often breeds. Most numerous on the Pond. 81 counted, mostly on Pond, 16.iii.1958.—*J.S.* 135 on Pond, 18.iii.1960.—*J.W.L.*

***A. ferina** (*L.*). Pochard. One ♂ on Lake and the next day on Pond, 7/8.v.1958; one ♂ on Pond, 12.iv.1959, and again, 16.iii.1960.—*J.S.*

***Bucephala clangula** (*L.*). Goldeneye. An adult ♂ on Pond, 25.iii. 1954.—*J. Claiden.* One on Pond during March and April 1955; one ♂ on Lake, with Tufted Duck, 3.iv.1956.—*J.S.* One on Pond, 17–18.ii.1956.—*R. Knox.*

*[**Melanitta nigra** (*L.*). Common Scoter. One on River-bank by Gardens, 12.xii.1952.—*A. C. G. Wiltshire*].

***Branta canadensis** (*L.*). Canada Goose. Four flying over N. end of Gardens at 7 a.m., 17.vii.1959.—*J.S.*

***Cygnus olor** (*Gmel.*). Mute Swan. A few seen in flight now and then. A pair on the Pond, driving off a third, at 8.35 a.m. on 6.x.1960; 2 still there the next day.—*E.M.-R.*

Falconidae

Accipiter nisus (*L.*). Sparrow Hawk. Nested successfully (3 young reared) near Bamboo Garden, 1950.—*J.W.L.* Nested unsuccessfully in Azalea Garden, 1954.—*J.W.L. & J.H.H.* Nested near Bamboo Garden, 1959, but result not known.—*J.W.L.* [F.8; XVIII.63, 1936].

Phasianidae

Alectoris rufa (*L.*). Red-legged Partridge. A pair with two half-grown chicks in Queen's Cottage woods, 12.viii.1953.—*J.W.L. & J.H.H.* 5–7 feeding on acorns and beech-mast, i.1956.—*A. C. G. Wiltshire.* [XXI. 232, 1949.]

Perdix perdix (*L.*). Partridge. A pair nested in Queen's Cottage woods, 1954.—*J.W.L. & J.H.H.* One seen near Palm House, 9.iii.1959.—*J.S.* [F.9].

Rallidae

[**Rallus aquaticus** *L.* Water Rail. One in tow-path ditch just outside Gardens, 17.iii.1953.—*A. C. G. Wiltshire*]. [F.9].

Fulica atra *L.* Coot. 85 counted on Lake, ii.1954.—*J.H.H.* 44 on and around Lake, 19.i.1958.—*J.S.* 200+ on Lake, then partly covered with melting ice, 17.i.1960.—*B. H. Harley & E.M.-R.* [F.9].

Charadriidae

Vanellus vanellus (*L.*). Lapwing or Peewit. Seen flying over occasionally. Flock of 15 passing over, 15.vii.1959; flock of 20, 5.ix.1959; four, 18.vi.1960.—*J.S.* [XVIII.63, 1936].

SCOLOPACIDAE

Scolopax rusticola *L.* WOODCOCK. One in Queen's Cottage Wood, i.1951.—*J.H.H.* One in Conifer collection, 22.xi.1954; one in Queen's Cottage grounds, 5.ii.1956.—*J.S.* [F.9; Kew Bull. 1934: 135].

[**Capella gallinago** (*L.*). SNIPE. One in tow-path ditch, just outside Gardens, 1954.—*J.H.H.*]. [Kew Bull. 1934: 135].

Tringa hypoleucos *L.* COMMON SANDPIPER. [Frequent on River-bank in summer, but seldom recorded for Gardens]. One (no details of locality), 20.xi.1952.—*P. Bland.* One in flight over Pond, 7.20 a.m., 11.viii.1956.—*J. H. Claiden & J.S.* One by boathouse on Lake, 17.vii.1960.—*J.S.* [F.9; cf. XVIII.63, 1936].

COLUMBIDAE

Columba oenas *L.* STOCK DOVE. Has ceased to nest owing to loss of suitable old trees, 1957–58.—*J.W.L.* Not recorded in 1959.—*J.S.* [F.9].

Streptopelia turtur (*L.*). TURTLE DOVE. One seen eating peas, end of v.1958.—*S. W. Rawlings.* The last previous record seems to have been that by H. N. Ridley in the 'Report of the Committee on Bird Sanctuaries in Royal Parks (England) for 1936': 33–34 (1937). [F.9.]

CUCULIDAE

Cuculus canorus *L.* CUCKOO. Two young reared in 1952, both by Dunnocks (*Prunella modularis* [L.]).—*J.W.L.* Apparently absent from the Gardens in 1959 & 1960, and only one recorded on passage, namely one young, S. end of Palace Lawn, 13.viii.1960.—*J.S.* [F.8; XXI.232, 1949].

STRIGIDAE

***Athene noctua** (*Scop.*). LITTLE OWL. Pair near Old Deer Park boundary 1951—definitely with families 1951, 1952 and 1957. [The nest has always been just outside the fence and in 1958 was well out on the Golf Course.]—*J.W.L.* Two, 30.i.1951; one near Kew Palace, 19.vii.1951.—*J.S.*

ALCEDINIDAE

Alcedo atthis *L.* KINGFISHER. Permanent resident, viii–xi.1951. Occasional, Pond and Water Garden, Winter 1952–53; three present on a single day, 10.xii.1956.—*J.W.L.* Regular winter visitor to the west end of the Lake and the Lily Pond; occasionally seen by the Pond. [F.8; Kew Bull. 1934: 135; XVIII.62, 1936].

PICIDAE

Dryobates minor (*L.*). LESSER SPOTTED WOODPECKER. Seen in 1951 and 1952. Seen on several occasions in Spring 1956, but nesting not proved.—*J.W.L., J.H.H., J.S.* A very occasional visitor, 1957–58. [The record in F.8 is probably an error for *D. major* (L.), the Greater Spotted Woodpecker.] [XVIII.62, 1936].

CORVIDAE

Corvus cornix *L.* HOODED CROW. One, with Carrion Crows (*C. corone* L.), 24.ii.1951.—*J.W.L.* [F.7].

Pica pica (*L.*). MAGPIE. A pair, the first certain record since 1906, 27/28.iv.1951.—*J.S.* Noted 5 times in Queen's Cottage woods, 1953.—*J.W.L.* One near Australian House, 29.ix.1954.—*J. Slater.* One, in Corsican Pine near Main Gate, 17.iii.1955, and nearby for a day or so afterwards; one, 28.x.1956; one near Temperate House, 19.iii.1960.—*J.S.* [F.7; XVIII. 62, 1936].

PARIDAE

Parus ater *L.* COAL TIT. Becoming more plentiful, and tame. Taking food from visitor's hand, 1.ii.1960. [F.5; XVIII.61, 1936; XXI.231, 1949.]

P. palustris *L.* MARSH TIT. One in willow tree near Lake, 14.i.1951.—*A. Sayers.* [F.5; XVIII.62, 1936].

Aegithalos caudatus (*L.*). LONG-TAILED TIT. Parties seen from time to time in the winter: 26.i.1951; 10.xi.1951. Flocks of 7–10 seen in autumn and winter, 1952. Seen in both spring and autumn, 1955 and 1956. A party of 19, x.1956.—*A. F. Mitchell.* A pair deserted from furze (*Ulex*) near the Old Deer Park boundary, iv. 1960.—*J.W.L.* A pair nested successfully in a *Berberis stenophylla* bush near the Palace cottages, v.1960.—*M. J. Sands, M. Perkins, J.S.* [XVIII.62, 1936].

TURDIDAE

Turdus pilaris *L.* FIELDFARE. A number roosted in Queen's Cottage shrubs, 1954. [F.4; XVIII.61, 1936].

T. musicus *L.* REDWING. A small flock usually in the Gardens during the winter. Hundreds roosting in Rhododendron Dell during cold spell, ii-iii.1954. [XVIII.63, 1936].

T. merula *L.* BLACKBIRD. In 1958 a pair of blackbirds made their nest on a small ledge (the top of a thick plank leaning against the wall), about 6 inches square and about 3 feet from the ground, at the back of the connecting corridor between Wings B and C of the Herbarium. It is not known whether a family was raised. In the Spring of 1960, a pair commandeered the soft top of a mop, left for the week-end up-ended against the west wall of Wing C of the Herbarium, underneath the wooden steps leading from the 'Marquand memorial window' to the staff room. Despite the clattering of staff up and down the steps several times a day, barely 2 feet from the site, the nest was completed, four eggs were laid, four chicks were hatched and reared, and these flew safely on June 2nd. [F.4; XVIII.61, 1936].

Oenanthe oenanthe (*L.*). WHEATEAR. Two on spring migration, 6 & 19.iv.1951; one, a dark female, on tall tree by River, 28.ix.52.—*J.W.L.* One ♂ on Palm House front, 6.30 a.m., 8.v.1954; another, resting and feeding, same place, 7 a.m., 16.v.1957.—*J.S.* [XVIII.64, 1936; XXI.232, 1949].

Phoenicurus phoenicurus (*L.*). REDSTART. Twice recorded on passage in 1953. [F.4].

SYLVIIDAE

Acrocephalus schoenobaenus (*L.*). SEDGE WARBLER. One heard singing on island in Lake, 22.v.1954.—*J.H.H.* Also 13.v.1956.—*J.W.L. & J.H.H.* [F.5].

Sylvia communis *Lath.* WHITETHROAT. A pair bred near the southern boundary, 1951.—*J.W.L.* [F.4].

S. curruca (*L.*). LESSER WHITETHROAT. One seen near Isleworth Gate, 5.v.1953.—*J.W.L.* [F.5].

Phylloscopus sibilatrix (*Bechst.*). WOOD WARBLER. One heard singing in Queen's Cottage woods, 17.v.1955.—*W. P. White.* [F.5; XVIII.64, 1936].

REGULIDAE

Regulus regulus (*L.*). GOLDCREST. A pair nested in the Arboretum (in *Cupressus lawsoniana* Murr., = *Chamaecyparis laws.* [Murr.] Parl.) in 1952. An unmated ♂ also present. A pair nested in a Spruce S. of the Lake in 1954, seen building 5.iv.1954.—*E. D. Bushby.* [F.5].

MUSCICAPIDAE

***Muscicapa hypoleuca** (*Pall.*). PIED FLYCATCHER. One ♀ seen near Lily Pond, 2.v.1953.—*J.S.*

MOTACILLIDAE

Anthus trivialis (*L.*). TREE PIPIT. One, outskirts of Queen's Cottage woods, 15.iv.1951.—*J. A. Edwards.* This is the only record since Hudson. [F.6].

Motacilla cinerea *Tunst.* GREY WAGTAIL. Present each year from 1952 to 1958, favouring manure heaps in the stable yard. Seen also in the Water Garden, 4.i.1960. [XVIII.62, 1936; XXI.231, 1949.]

LANIIDAE

***Lanius excubitor** *L.* GREAT GREY SHRIKE. One seen flying round and perching on trees at the River end of Lake for a considerable time, 15.xii. 1956.—*A. C. G. Wiltshire.*

FRINGILLIDAE

Coccothraustes coccothraustes (*L.*). HAWFINCH. 11 present early in 1951; 1 pair known to have nested. 3 pairs nested in 1952, two of which were successful. 2 pairs nested in 1953 and 1954. Not known to have nested in 1956–58. [F.6; XX.119, 1948.]

Chloris chloris (*L.*). GREENFINCH. About 100 seen on spent hops in Arboretum Nursery, 10.ii.1960.—*J.S.* [F.6].

Carduelis carduelis (*L.*). GOLDFINCH. Probably increasing; often seen feeding on seed of Plane trees (*Platanus*). [F.6].

C. spinus (*L.*). SISKIN. 1 ♂ and 2 ♀♀ feeding under Alders (*Alnus*) by Lake, 13.iii.1955.—*J.S.* [F.6].

C. cannabina (*L.*). Linnet. Probably breeds most years. Definitely nested in 1954, 1956, 1957.—*J.W.L.*

Pyrrhula pyrrhula (*L.*). Bullfinch. A family party seen, but nesting not proved, 22.viii.1951; a pair feeding on buds by Lake, 17.iii.1952.—*J.W.L. & J.H.H.* A pair with young near Palace, 19.vi.1954.—*E. D. Bushby.* A pair nested in Bamboo Garden in 1956.—*J.W.L. & J.H.H.* More common in 1959 & 1960 than in recent years.—*J.S.* [F.7].

Loxia curvirostra *L.* Crossbill. 3 ♀♀ seen on roof of Herbarium House, xi.1956.—*Mrs. E. F. Turrill.* [XVIII.61, 1936].

Fringilla montifringilla *L.* Brambling. One seen with Chaffinch under beech trees (*Fagus*), 9.iv.1952.—*J.W.L.* One with Chaffinches under beeches near Stable Yard, 1.ii.1954.—*J.S.* Two among mixed finches near Queen's Cottage, 4.ii.1958.—*J.W.L.* 15 on spent hops in Arboretum Nursery, 10.ii.1960.—*J.S.* Several with Chaffinches in Arboretum, 22.iii. 1960; 100+ with Chaffinches and Greenfinches, feeding on hop seed (*Humulus*) and hornbeam seed (*Carpinus*) in Arboretum, 31.iii and 1.iv.1960. The recent use of spent hops as a top dressing for shrubs has provided a rich additional source of food for finches.—*E.M.-R.* [F.7; XVIII.61, 1936].

Emberiza citrinella *L.* Yellowhammer. One ♂ and four ♀♀ in willows near River, 25.i.1958.—*J.W.L.* [F.7].

***E. schoeniclus** (*L.*). Reed Bunting. 1 on island in Lake, 16.iv.1953.—*G. R. Jones.*

Invertebrata

MOLLUSCA-GASTROPODA

Helicidae

***Helix pomatia** *L.* Roman Snail. A living specimen was found near the Tennis Courts, probably about May 1954; unfortunately exact details of date and finder have been mislaid. No satisfactory explanation has yet been suggested for this curious occurrence.

ANNELIDA

PLATYHELMINTHES-TURBELLARIA

Bipaliidae

†**Bipalium kewense** *Moseley.* A single specimen was seen crawling over bare soil in the Aroid House, 9.xii.1947, *H.K.A.S.* (Det. Dr. H. A. Baylis). 'First described from one of the hothouses [at Kew] in 1878, and has turned up sporadically ever since. It has been recorded from a great many parts of the world, having been widely distributed by human agency, but its original home is uncertain—probably some of the tropical islands of the Pacific. It feeds on earthworms. . . It may be quite common in the hothouses, but would be easier to find at night, when it would probably leave its hiding-places and crawl about' (Baylis *in litt.*). [F.68].

ARTHROPODA

DIPLOPODA-CHILOGNATHA

CRASPEDOSOMATIDAE

***Polymicrodon polydesmoïdes** (*Leach*). In Herbarium greenhouse, 16.v.1958, *J.L.G.* (Confirm. J. G. Blower).

DIPLOPODA-PSELAPHOGNATHA

POLYXENIDAE

*[**Polyxenus lagurus** (*L.*). On inside wall near window of first-floor room of house in Ennerdale Road, Kew Gardens, 29.vii.58, *H.K.A.S.* (Det. K. H. Hyatt). Records of this very curious little millipede are said to be 'few and widely scattered' (Blower, 1958, 'British Millipedes (Diplopoda)': 14 [Linn. Soc. Synopses Brit. Fauna, No. 11]). It has not yet been recorded from the Gardens proper, but the present occurrence is only 200 yards from the boundary. Although so small (only 2–3 mm. long), it is a remarkable little creature, as may be seen from the excellent illustration (fig. 10, p. 15) in Blower's work. Whilst trying to secure the present specimen, I noticed that it was unusually sensitive to any object placed in its path: even a piece of paper laid flat on the wall 2 inches ahead of it caused it to stop and double back on its tracks. It seems possible that the astonishing array of tufts and bristles with which it is provided acts as a kind of hyper-sensitive 'radar' equipment. Another specimen was found in a different first-floor room of the same house, 11.ix.60, *H.K.A.S.*]

CHILOPODA

GEOPHILIDAE

***Brachygeophilus truncorum** (*Bergsöe & Mein.*). Among yew litter, S. end of Gardens, 12.vii.1959, *J.L.G.* (Det. J. G. Blower).

SYMPHYLA

SCUTIGERELLIDAE

***Hanseniella unguiculata** *Hans.* 1 adult and 2 larvae in Aroid House; 2 adults and 1 larva in Palm House, iii.1960, *Dr. B. Condé* (Nancy, France). (Det. Dr. C. A. Edwards, Rothamsted).

SCOLOPENDRELLIDAE

***Symphylella vulgaris** *Silv.* 1 larva in Aroid House, iii.1960, *Dr. B. Condé.* (Det. Dr. C. A. Edwards).

These are the first records of any *Symphyla* from Kew—perhaps not surprisingly, in view of their minute size and inconspicuous habits. Dr. Edwards writes that he had previously found both these species at Kew some years ago. He mentions that *Hanseniella unguiculata* will actually feed on the roots of plants, though the *Symphyla* normally feed upon decaying vegetable matter. The most accessible account of these little creatures is probably that given by Cloudsley-Thompson, 'Spiders, Scorpions, Centipedes and Mites': 64–68 (1958). See also Pocock, 'Guide Arachn., Millip., Centip., Dept. Zool., Brit. Mus. (N.H.)': 47 (1928).

ARACHNIDA

Araneae

DICTYNIDAE

Ciniflo ferox (*Walck.*). In greenhouse, Herbarium Experimental Ground, 8.x.1958, *J.L.G.* (Det. E. Browning). [F.56].

LINYPHIIDAE

Stemonyphantes lineatus (*L.*). 1 ♀ in Herbarium greenhouse, 25.v.59, *J.L.G.* (Det. K. H. Hyatt). [F.57].

CLUBIONIDAE

†**Cheiracanthium africanum** *de Less.* On *Dahlia* flowers sent from Marandellas, S. Rhodesia, 3.iii.60, *Mrs. A. J. Thorpe.* (Det. K. Hyatt).

Acari

TARSONEMATIDAE

***Hemitarsonema tepidariorum** *Warburton.* A pest in Fern House, damaging *Pteris tripartita* (Presl) Sw., *Diplazium procumbens* Holtt. and *D. procerum* (Sod.) C.Chr., 16.v. & 28.vii.55, *A. H. G. Alston.*

MACROCHELIDAE

***Parholaspulus alstoni** *Evans.* In No. 3 Fern House, 1955, *A. H. G. Alston.*—See Evans in Proc. Zool. Soc. 127: 345–377 (1956).

***Parholaspis kewensis** *Evans.* Under fallen fruits of *Caryota mitis* Lour. in the Aroid House, 1955, *Dr. G. O. Evans.*

***Holaspulus tenuipes** (*Berlese*). With the last.

EVIPHIDIDAE

***Eviphis uropodinus** *Berlese.* With the last.

TETRANYCHIDAE

***Schizotetranychus schizopus** (*Zacher*). Swarming on lower surface of leaves of × *Salix forbyana* Sm. in Herbarium Experimental Ground, 7.vii.60, *H.K.A.S.* (Det. D. Macfarlane). Causing conspicuous yellow discolouration of affected leaves.

INSECTA

DIPLURA

CAMPODEIDAE

Campodea sp. (condition inadequate for determination), under log near Tennis Courts, 14.vi.59, *J.L.G.* [Cf. XII.366, 1911.]

COLLEMBOLA

(all det. P. N. Lawrence, unless otherwise stated).

ACHORUTIDAE

***Hypogastrura** (**Hypogastrura**) **purpurascens** (*Lubb.*). In Cactus House, 27.ix.59, *J.L.G.*

***H.** (**Ceratophysella**) **armata** (*Nicolet*), *agg.* In Cactus House, 27.ix.59, *J.L.G.*

ONYCHIURIDAE

***Onychiurus fimetarius** (*L.*), *agg.* In greenhouse, Herbarium Experimental Ground, 6.x.58 & 10.vii.59, *J.L.G.*

***O. burmeisteri** (*Lubb.*). Under log near Tennis Courts, 14.vi.59, *J.L.G.*

ISOTOMIDAE

***Isotoma** (subgenus **Vertagopus**) **arborea** (*L.*), *agg.* Under soil on Thames-side wall of Gardens, between Palace and allotments, 16.xi.58; under log near Tennis Courts, 14.vi.59, *J.L.G.*

***I. olivacea** *Tullb.* Under dead grass beneath yew trees, S. end of Gardens, 25.x.59, *J.L.G.*

***Tomocerus minor** (*Lubb.*). In Cactus House, 21.vi.59, *J.L.G.*

ENTOMOBRYIDAE

Orchesella villosa (*L.*). In Herbarium Greenhouse, 15.ii.59; in yew litter, S. end of Gardens, 29.vii.59, *J.L.G.* [XII.366, 1911.]

***O. cincta** (*L.*). In yew litter, S. end of Gardens, 12 & 29.vii.59, *J.L.G.*

***Isotomurus palustris** (*Müller*). Under dead grass beneath yew trees, S. end of Gardens, 25.x.59, *J.L.G.*

SMYNTHURIDAE

*†**Sminthurinus trinotatus** (*Axelson*). On flowerpots in greenhouse in Herbarium Experimental Ground, 11.vii–14.x.58, *J.L.G.* Believed to be an introduced species. Despite its minute size, its globular, shining jet-black body, decorated with three brilliant white spots, renders it a striking object under the lens. (Det. Miss T. Clay).

***S. niger** (*Lubb.*), *agg.* In Greenhouse, Herbarium Experimental Ground, 5.vi.59; in Cactus House, 21.vi.59, *J.L.G.*

***Arrhopalites caecus** (*Tullb.*). In greenhouse, Herbarium Experimental Ground, 3.vi.59, *J.L.G.*

In addition to the above, a considerable quantity of material, so far named as to genus only, awaits specific determination. It includes the following (all coll. *J.L.G.*, unless otherwise stated): *Orchesella*, *Entomobrya*, *Lepidocyrtus*, yew litter, 12.vii.59; *Entomobrya*, *Isotomurus*, *Sminthurinus*, Herbm. Exp. Ground, 14.vii.59; *Bourletiella* (*Deuterosminthurus*), *Isotomurus*, Herbm. Greenhouse, 10.vii.59; *Entomobrya*, *Isotomurus*, *Lepidocyrtus*, ibid., 5.vi.59; *Entomobrya*, *Tomocerus*, Cactus House, 21.vi.59; *Isotomurus*, *Lepidocyrtus*, *Isotoma*, *Entomobrya*, yew litter, 29.vii & 2.viii.59; *Entomobrya*, *Tomocerus*, Cactus House, 27.ix.59; *Lepidocyrtus* and *genus indet.*, Herbm. Exp. Ground, 28.ix.59, *Miss S. S. Hooper*; *Pseudosinella*, under yews, 4.x.59; *Lepidocyrtus*, in Herbarium, *ex* Orchid House, 19.v.59, *P. F. Hunt*; *Lepidocyrtus*, dead grass under yews, 25.x.59.

PSOCOPTERA

CAECILIIDAE

***Caecilius burmeisteri** *Brauer.* Beneath yew trees, S. end of Gardens, 30.viii.59, *J.L.G.* (Det. D. E. Kimmins).

TROGIDAE

***Hyperetes guestfalicus** *Kolbe*. Among yew litter, S. end of Gardens, 12.vii.59, *J.L.G.* (det. D. E. Kimmins).—These are the first records of any *Psocoptera* from the Gardens.

HEMIPTERA-HETEROPTERA

LYGAEIDAE

***Scolopostethus affinis** (*Schill.*). One in short grass behind Herbarium, 3.vi.60, *H.K.A.S.*

CIMICIDAE (*Anthocorinae*)

***Anthocoris nemorum** (*L.*). One hibernating inside a fallen walnut at S. end of Gardens, 14.xii.58, *J.L.G.*

MIRIDAE

***Deraeocoris** (**Camptobrochis**) **lutescens** (*Schill.*). On *Acer* and *Quercus* spp. near Temperate House, 6.viii.60, *H.K.A.S. & L. Watson.*

***Plagiognathus arbustorum** (*F.*). On hybrid *Verbascum* behind Herbarium, 9.viii.60, *H.K.A.S.* A common and ubiquitous little species, frequently swarming on nettles.

[***Plagiognathus albipennis** (*Fall.*). In house in Ennerdale Road, Kew Gardens, 22.vi.60, *H.K.A.S.* Attached to *Artemisia* spp.]

***Pilophorus perplexus** *Dougl. & Scott.* 1 adult preying on aphids on *Crataegus monogyna* Jacq. near S. end of Succulent House, 28.vii.60, *H.K.A.S.* An attractive chocolate-brown bug with two transverse silver bars. The aphid colony, at the apex of a shoot, had been completely exterminated, every individual having been sucked dry. A few black ants (probably *Lasius niger* L.) were also present.

Blepharidopterus angulatus (*Fall.*). Abundant on × *Sorbaronia alpina* (Willd.) C. K. Schneid., near Temperate House, 6.viii.60, *L. Watson & H.K.A.S.* [XX.116, 1948.]

***Megacoelum infusum** (*Herr.-Schaeff.*). Characteristic nymph (second instar) on *Quercus lusitanica* Lam. near Cambridge Cottage garden, 21.vii.60, *L. Watson.* Strictly attached to oak in this country.

***Phytocoris tiliae** (*F.*). Nymph and adults on *Quercus* spp. near Cactus House and Temperate House, 29.vii. & 6.viii.60, *L. Watson & H.K.A.S.*

***Liocoris tripustulatus** (*F.*). One in Herbarium, 14.ix.59, *P. F. Hunt.* A common species, attached to nettles.

HEMIPTERA-HOMOPTERA

CICADELLIDAE

***Iassus lanio** (*L.*). On *Quercus* sp., near Temperate House, 6.viii.60, *H.K.A.S. & L. Watson.* Parasitized by a Dorilaid fly.

TYPHLOCYBIDAE

***Dikraneura** (**Notus**) **flavipennis** (*Zett.*). In some numbers on *Carex* spp. in Orders beds, 13.vi.60, *V. F. Eastop & H.K.A.S.* (Det. R. J. Izzard).

***Typhlocyba quercûs** (*F.*). On × *Sorbaronia hybrida* (Moench) C. K. Schneid., near Temperate House, 6.viii.60, *L. Watson & H.K.A.S.* Doubtless a stray from nearby oak.

***Cicadella** (**Eupteryx**) **atropunctata** (*Goeze*). On Cucurbit in Orders beds, Herbaceous Ground, 8.viii.60, *L. Watson.* Doubtless strayed from nearby Labiates.

PSYLLIDAE (CHERMIDAE) (APHALARIDAE)

***Aphalara calthae** (*L.*). Under dead grass beneath yew trees, S. end of Gardens, 25.x.59, *J.L.G.*

APHIDIDAE (all det. J. P. Doncaster)

Aulacorthum (**Neomyzus**) **circumflexum** (*Buckt.*). On *Eulophidium saundersianum* (Reichb.f.) Summerh. in Orchid House, 14.i.60, *P. F. Hunt.* 'A rather common glasshouse species which can occur in numbers sufficient to cause damage to the plants it likes best' (J. P. Doncaster *in litt.*). [XV.212, 1920.]

***Aphis farinosa** *Gmel.* On *Salix nigricans* Sm. in Herbarium Experimental Ground, 17.vi.59, *H.K.A.S.*

***A.** (**Doralis**) **fabae** *Scop., agg.* An immense population swarming on *Celastrus orbiculatus* Thunb. on E. wall of Wing C of Herbarium, vi.59 (and in previous years), *H.K.A.S.*; on *Oenothera* sp. in Herbarium Experimental Ground, vi.59, *J.L.G.*

Dysaphis (**Pomaphis**) **pyri** (*B. de Fonsc.*). On *Oenothera* sp., with above, vi.59, *J.L.G.* [XV.214, 1920].

Myzus cerasi (*F.*). On *Prunus* sp., near Orangery, vi.59, *J.L.G.* [XV.213, 1920].

Anoecia corni (*F.*). Many individuals scattered over lower surface of *Cornus* (*s.l.*) sp. (prob. *Thelycrania sanguinea* (L.) Fourr.) at S. end of Gardens, 12.ix.59, *H.K.A.S.* This species spends the summer underground on grass-roots. (Det. from description only; subject to confirmation.) [XV.214, 1920].

***Tuberolachnus salignus** (*Gmel.*). Very large populations on main stems and smaller twigs of *Salix caprea* L. × *viminalis* L. behind Herbarium, and smaller assemblages on *Salix nigricans* Sm., *ibid.*; first noted 11.x.59, *H.K.A.S.* Many wasps (including possibly *Vespula rufa* (L.)) were attracted to honeydew on stems and foliage beneath colonies. The colonies were later heavily decimated by frosts, the dead individuals being left hanging from the branches by their inserted probosces. Last living specimen noted 1.ii.60. Mr. Doncaster writes: 'The life-history of this aphid is still something

of a mystery. So far as I know, no one has discovered where it spends the winter, or where the individuals which start the late summer colonies originate; and this despite the fact that it has a world-wide distribution and has been well known for over a century!'

Coccidae

†***Diaspis echinocacti** (*Bouché*). In small numbers on Cacti in Cactus House, vi.53, *Dr. K. Boratyński.*

†**Aspidiotus cyanophylli** *Signoret.* In localised but crowded colonies, heavily parasitized by hymenopterous insects, in Cactus House, vi.53, *Dr. K. Boratyński.* [F.30].

LEPIDOPTERA

Caradrinidae

Apatele (**Acronicta**) **rumicis** (*L.*). Knotgrass Moth. Larva on *Populus* near Tennis Courts, 29.viii.59, *E.M.-R.* The larva of this common moth is polyphagous, but is more commonly found on low-growing herbaceous plants than on trees or shrubs. [III.160, 1907.]

Peridroma saucia (*Huebn.*). Pearly Underwing. In Herbarium, 19.ix.50, *H.K.A.S.* [III.161, 1907].

Plusiidae

Catocala nupta (*L.*). Red Underwing. A specimen actively flying inside a window on the top floor of Wing A of the Herbarium, 28.vii.59, *J. Tennant.* Another flying actively just *outside* a ground floor window on S. side of Wing B, in brilliant sunshine, about 11.30 a.m., 18.viii.59, *P. F. Hunt.*—A curious coincidence. During more than 30 years I have never seen or heard of a Red Underwing in the vicinity of the Herbarium. It suggests the possibility of an unusual (local or more general) abundance of the species in 1959. The larva is a willow-feeder.—*H.K.A.S.* [F.39].

Pyraustidae

***Pyrausta nubilalis** (*Huebn.*). 'European Corn Borer'. A ♂ found dead in Herbarium, 8.vii.58, *H.K.A.S.* 'A casual immigrant which occasionally becomes established in southern England' (Beirne, *l.c. infra*). Its chief British headquarters at the present time appear to be in South Essex. In Britain, the larva burrows in the stems of *Artemisia vulgaris* L. (mugwort), and has been raised on *Humulus lupulus* L. (hop). 'On the Continent and in North America it is a serious pest of maize [*Zea*] and it is known to attack over 200 species of plants including potato, beans, celery and various garden flowers' (Beirne, *l.c.*).—See Leach, 'Brit. Pyralides': 32, t. 4, fig. 4 (1886) (as *Botys nubil.*); Meyrick, 'Rev. Handb. Brit. Lep.': 433 (1927); Beirne, 'Brit. Pyralid and Plume Moths': 151–2, t. 13, figs. 4–5 (1952).

Phaloniidae

***Phalonia cnicana** (*Doubleday*). Herbarium Experimental Ground, 2.viii.60, *L. Watson & H.K.A.S.* Attached to thistles.

GRACILLARIIDAE

***Lithocolletis mespilella** (*Huebn.*). Bred from mines in leaves of × *Sorbaronia alpina* (Willd.) C. K. Schneid., near Temperate House, coll. 6.viii.60, *L. Watson.*

COLEOPTERA

SILPHIDAE

[**Necrophorus vespillo** *L.* Found near Kew Gardens Station and brought to the Office by a visitor as a 'Colorado Beetle', 9.ix.58!] [XI.83, 1910.]

STAPHYLINIDAE

***Philonthus fuscipennis** *Mannerh.* In *Sphagnum* (purchased in Brentford Market) in Orchid Houses, 8.iii.60, *G. Nicholson.* (Det. J. Balfour-Browne).

NITIDULIDAE

†***Stelidota strigosa** *Gyll.* A living specimen found in a consignment of orchids from Dominica, W.I., 6.xi.58, *Dr. R. W. G. Dennis.* Widely distributed in Central America and West Indies; larvae and adults probably feed on flowers and/or seeds. (Det. J. Balfour-Browne).

LATHRIDIIDAE

†**Cartodere filum** *Aubé.* A flourishing colony of this 'old friend', including a number of larvae, was found on a fine crop of mould on dried plant specimens from British Guiana in the Herbarium Store, 25.ix.59, *D. Philcox.* [XX.118, 1948; XVI.235, 1949.]

COCCINELLIDAE

***Scymnus nigrinus** *Kugelann.* On *Acer* sp. near Temperate House, 6.viii.60, *H.K.A.S. & L. Watson.* A minute jet-black relative of the ladybirds.

TENEBRIONIDAE

†***Platydema convexifrons** *Chev.* Received alive in consignment of fungi and fruits from Zanzibar, East Africa, iii.1960, coll. *Mrs. H. G. Faulkner.* (Det. C. M. F. von Hayek.)

CERAMBYCIDAE

Prionus coriarius *L.* Found by a visitor under an old oak near the *Philadelphus* collection, 31.viii.56, and brought to *J. Souster.* It is good to know that this fine beetle is still in the Gardens. [See XXI.235, 1949.]

BRUCHIDAE

†***Spermophagus elizabethae** *Pic.* Emerged 9.iii.60, from fruits of *Dioscorea* sp. from N. Nigeria (Jos Plateau or Bauchi Prov.), coll. *Sir Geoffrey Keynes* (per J. S. L. Gilmour). (Det. R. D. Pope).

CHRYSOMELIDAE

†***Chrysomela superba** *Thunb.* Two found alive in parcel of living orchids, etc., from forest at 5–8000 ft. on Kungwe Mt., Kigoma Distr., Tanganyika, ix.1959, coll. *R. M. Harley.* (Det. E. B. Britton). Mr. Britton states that nothing is known regarding the biology of this species.

CURCULIONIDAE

†***Antliarrhinus verdcourti** *G. Marshall.* Abundant (in Herbarium Store) on ripe ♀ cone of *Encephalartos tegulaneus* Melville that had been collected at Lolokwe on the Mathews Range, Kenya, by Mrs. Joy Adamson and forwarded to Kew by Dr. B. Verdcourt, 15.vii.1954.—*E.M.-R.* The weevil had clearly been feeding on the rhachis of the cone, thus assisting in its disintegration and the release of the seeds.—See Ann. Mag. Nat. Hist. 8: 300 (1955) & Ent. Mon. Mag. 93: 10 (1957).

HYMENOPTERA-SYMPHYTA

BLASTICOTOMIDAE

***Blasticotoma filiceti** *Klug.* Larvae boring in stems of *Athyrium filix-femina* (L.) Roth (Lady Fern), in fern garden at base of foundations of old Ice House, 4/5.viii.53, *A. H. G. Alston & R. B. Benson.* Presence of larvae indicated by conspicuous balls of froth.—See Benson in Ent. Mon. Mag. 89: 304 (1953).

TENTHREDINIDAE

***Nematus pavidus** *Lepel.* Many larvae on *Salix nigricans* Sm. in Herbarium Experimental Ground, 17.vi.59, *H.K.A.S.* (Det. R. B. Benson.)

HYMENOPTERA-ACULEATA

FORMICIDAE (*Myrmicinae*)

†**Wasmannia auropunctata** (*Roger*). A number of living specimens (wingless ♀♀ and workers) of this well-known species at Kew were found in a consignment of orchids from Dominica, W.I., 6.xi.58, *Dr. R. W. G. Dennis.* (Det. Dr. I. H. H. Yarrow.) [XIX.392, 1938.]

CHALCIDIDAE

***Comedo opaculus** *Thoms.* Emerged from Microlepidopterous leaf-roller [? *Pyrausta* (*Phlyctaenia*) *coronata* Hufn. (*sambucalis* Schiff.)] on *Sambucus nigra* L. near Wing C of Herbarium, 20.ix.47, *A. A. Bullock.* (Det. J. F. Perkins & R. B. Benson.) 'A general parasite of Lepidoptera'.

PTEROMALIDAE

***Stenomalus muscarum** (*L.*) In large numbers on inside of windows of Wing B of Herbarium, ix.58, *E.M.-R.*

DIPTERA

ASILIDAE

***Machimus atricapillus** *Fall.* Persistently settling on white page of notebook, S. end of Gardens, 31.viii.58, *J.L.G.*

TRYPETIDAE

***Urophora cardui** (*L.*). Characteristic gall on *Cirsium arvense* (L.) Scop. behind Herbarium, 11.ix.59, *H.K.A.S.*

Diptera bred from Myxomycetes

In the summer of 1952 and 1953 large quantities of the myxomycete, *Fuligo septica* Gmel. ('Flowers of Tan'), appeared on coffee grounds that had been used as a mulch under shrubs in the Gardens. Samples were taken by Dr. P. A. Buxton on June 11 and 15, 1953, and an attempt was made to breed Diptera from each sample separately. A paper embodying the results was published by Dr. Buxton in 1954 under the title: 'British Diptera associated with Fungi. 2—Diptera bred from Myxomycetes' (Proc. Roy. Ent. Soc. London, Ser. A, Gen. Ent. 29 (10–12): 163 ff. (1954)). The following records are extracted; for fuller details the original paper should be consulted.—*J.H.H.*

Scatopsidae

***Scatopse fuscipes** *Meig.* Relation to Myxomycete doubtful.

Mycetophilidae-Sciarinae (Sciaridae)

***Sciara** (**Scatopsciara**) **vivida** *Winnertz.* Relation to Myxomycete not established.

Empididae

***Drapetis** (**Crossopalpus**) **nigritella** (*Zett.*). Relation to Myxomycete doubtful; association may be fortuitous.

Lonchaeidae

***Lonchaea chorea** *F.* (*vaginalis* Fall.). Association with *Fuligo* apparently established, though not necessarily obligate.

Sphaeroceridae (Borboridae)

***Paracollinella** (**Leptocera**) **fontinalis** (*Fall.*). Association doubtful.

Drosophilidae

***Drosophila repleta** *Wollaston.* Association apparently fortuitous. Larva also bred from Agarics in Kent.

Muscidae

***Delia** (**Hylemyia**) **cilicrura** (*Rond.*). Larva known to feed on a wide range of decaying and living plant-substances.

Some leaf-mining Agromyzidae (Diptera) noted at Kew

by Kenneth A. Spencer

For some years, mainly between 1952 and 1955, I made an intensive study of the leaf-mining *Agromyzidae* in this country and at this time collected a number of interesting species at Kew. Details are given below of 30 species*, although it is possible that a number of other common species were not included in my records at the time and it is certain that additional species remain to be discovered. The total number of species now known in Great Britain in 279.

* These are all first records for the Gardens; asterisks have therefore been omitted.—*H.K.A.S.*

Agromyza demeijeri *Hend.* Occurs commonly on *Laburnum*, from June to September; the larva forms a conspicuous blotch-mine.

A. lathyri *Hend.* Mines formed in leaves and stem of *Lathyrus grandiflorus* L. and *L. tuberosus* L. The mines were observed at the end of June in 1953, 1954 and 1955. The species has not yet been bred in this country. (Spencer in Ent. Mon. Mag. 89: 296 (1953)).

A. nana *Mg.* Mines seen on *Melilotus officinalis* (L.) Pall., 13.vi.1953; a white blotch-mine is formed on the midrib. Common on many genera of the *Papilionaceae*.

A. nigrescens *Hend.* Linear-blotch mines, found on *Geranium pratense* L., 25.vi.1954.

A. rufipes *Mg.* The larvae form large blotch-mines, noted on *Anchusa officinalis* L., *Lycopsis arvensis* L., *Alkanna lutea* (DC.) Moris, *Cynoglossum officinale* L., *Borago officinalis* L., June and July, 1953.

A. spiraeae *Kalt.* Common on *Rosaceae*, noted on *Agrimonia odorata* (Gouan) Mill. and *A. repens* L., July 1953.

A. watersi *Spencer.* This species appears to be limited to *Lathyrus sylvestris* L. and *L. latifolius* L. Mines referable to this species were first found at Kew on the latter plant on 27.vi.1953, although the species was only described four years later, from material bred from *L. sylvestris* at Luccombe, I.o.W.

Phytobia flavifrons (*Mg.*). Larvae feeding on *Saponaria officinalis* L., 11.x.1952, and on *Melandrium dioicum* (L.) Coss. & Germ., 13.vi.1953. A whitish blotch-mine is formed and the species is common on many genera of *Caryophyllaceae*.

P. iraeos (*R.-D.*). The larvae mine singly in *Iris pseudacorus* L.; noted 13.ix.1953.

P. morionella (*Zett.*). Mines found July 1958 on *Marrubium vulgare* L. The only other record in this country is from Needles, I.o.W., on the same host.

P. posticata (*Mg.*). Blackish blotch-mines formed in *Solidago* spp. Common.

P. verbasci (*Bouché*). Large blotch-mines formed on *Verbascum* spp., noted 23.vii.1953.

Phytobia sp. Puparium noted in leaf-mine on *Carex hirta* L., 5.ix.1954. The species is probably *sönderupi* Hg., which is common on many *Carex* spp.

Liriomyza bryoniae (*Kalt.*). Leaf-mines on *Solanum villosum* Lmk. and *Atropa bella-donna* L., 13.ix.1953. The only other record of this species in this country is on glasshouse tomatoes in the Lea Valley, Herts.

L. sonchi *Hering*. On *Sonchus oleraceus* L. behind Herbarium, 4.ix.1959, *H.K.A.S.*

L. strigata *Mg*. Noted on many hosts. One of the most polyphagous of the *Agromyzidae*, occurring most frequently on many *Compositae*; other favourite hosts are *Campanula* spp. A characteristic leaf-mine is formed along the midrib with short lateral offshoots. The mines can be found from June to late autumn.

L. trifolii (*Burgess*). Noted on *Galega officinalis* L. and *Vicia benghalensis* L. (*V. atropurpurea* Desf.), 23.vii.1953. Occurs commonly on many *Papilionaceae*, favourite hosts being *Pisum* and *Vicia faba* L.

Phytomyza aconiti *Hend*. Bred from *Aconitum* sp., 26.vi.1954, and from *Delphinium* sp., 4.vii.1958. The larvae feed gregariously and form large blotch-mines which destroy entire leaves. The species occurs commonly in gardens on these hosts.

P. anthrisci *Hend*. Common on *Anthriscus sylvestris* (L.) Hoffm. from early spring until December.

P. atricornis *Mg*. This is the most common and polyphagous of the *Agromyzidae* in Britain. Its favourite hosts are among the *Compositae* and it is particularly often found on *Sonchus* and *Chrysanthemum*. At Kew it has also been noted on *Lathyrus* sp. The larva forms a characteristic whitish linear mine and the puparium remains in the mine; these mines are found at any time between April and November.

P. bipunctata *Lw*. The first British record of this species was on *Echinops banaticus* Rochel at Kew on 13.vi.1953; larvae were also feeding in October the same year. The species has subsequently been noted on *Echinops* spp. in gardens in various places in the London area. (Spencer in Ent. Mon. Mag. 89: 296 (1953)).

P. cytisi *Brischke*. Occurs commonly on *Laburnum*. Noted 19.vi.1953; a later generation was also seen in October.

P. conyzae *Hend*. Noted mining *Inula magnifica* Lipsky, 13.vi.1953. A common species.

P. ilicis *Curt*. Very common on holly. An irregular blotch-mine is formed on the midrib.

P. melana *Hend*. Noted mining *Pimpinella anisum* L., 26.vi.1954. Not uncommon in association with *Pimpinella* spp.

P. minuscula *Gour*. Common on *Aquilegia* spp. Noted 11.x.1952 on *A. skinneri* Hook. The larva forms a winding linear mine.

P. obscurella *Fall*. Occurs commonly on *Aegopodium podagraria* L. from spring to late autumn.

P. petöi *Hg.* Noted 13.vi.1953 on *Mentha longifolia* (L.) Huds. Occurs locally in association with this host.

P. ramosa *Hend.* Mines seen on *Dipsacus laciniatus* L. and *D. fullonum* L., 26.vi.1954. The larva forms a characteristic mine inside the midrib with short white offshoots along the leaf. Occurs commonly with the food-plant throughout the south of England.

P. ranunculi (*Schrk.*). Very common on most *Ranunculus* spp.

P. sphondylii *R.-D.* Common on *Heracleum*, occurring from June until late autumn. Also noted at Kew on *Astrantia trifida* Hoffm. (*A. biebersteinii* Trautv.), 20.vi.1955.

SIPHONAPTERA

PULICIDAE

***Pulex irritans** *L.* COMMON FLEA. Specimen taken on member of Herbarium staff in staff-room, 9.ix.58. It is due to the enterprise and co-operation of more than one member of the staff, who, however, in this case express an understandable desire to remain anonymous. The specimen was unfortunately somewhat damaged during capture.

***Ctenocephalides felis** (*Bouché*). CAT FLEA. One specimen found in the open in the Gardens, v.1958, *J.L.G.* (Det. R. S. George). This is, surprisingly(?), the first record of any species of this important order from the Gardens and Mr. George tells us that it is apparently the first official record of *C. felis* for Surrey!

FLORA

PHANEROGAMIA

CHENOPODIACEAE

***Chenopodium ficifolium** *L.* On heap of earth by path behind Aroid House, 6.viii.58, *J. P. M. Brenan*, and *H.K.A.S.* (independently).

ONAGRACEAE

***Epilobium lamyi** *F. Schultz.* A single plant on an overgrown allotment behind the Herbarium, 18.vii.58, *H.K.A.S.* (Det. J. P. M. Brenan & R. D. Meikle).

CONVOLVULACEAE

†***Ipomoea purpurea** (*L.*) *Roth.* Beneath bird table by Wing A of Herbarium, vi.59, *F. N. Hepper.*

†***Cuscuta campestris** *Yuncker.* By W. side of Wing A of Herbarium, parasitizing *Convolvulus arvensis* L., viii.1952, and every year till 1959, but absent in 1960, probably killed by the dry summer of 1959, *E.M.-R.* (Det. B. Verdcourt).

COMPOSITAE

***Hieracium perpropinquum** (*Zahn*) *Druce*. On bank of old filter-bed in Stable Yard, 1957, *J. Souster*. (=*H. boreale* auctt., *H. sabaudum* auctt.; incl. *H. bladonii* Pugsl.—Det. N. Y. Sandwith.)

GRAMINEAE

†***Vulpia megalura** (*Nutt.*) *Rydb*. From flax straw from W. Australia, used for mulch in private garden, and also in Yard, 26.viii.53, *J. Souster*. Native of N. America. Naturalised in Australia; introduced on several occasions into Britain, especially with 'Lend-Lease' seeds during the last war.—*C. E. Hubbard*.

†***Bromus carinatus** *Hook. & Arn.* (*Ceratochloa carinata* (Hook. & Arn.) Tutin).

This American grass, which is commonly known as 'California Brome', is now a firmly established alien at Kew.

It is indigenous along the Pacific coast of North America (from southern British Columbia to the northern part of Lower California), and was first collected by David Douglas on his second expedition to California during 1830–33. His material was named and described by Hooker and Arnott in their account of previous collections made during the Pacific voyage of Captain Beechey in H.M.S. *Blossom*, published in 1841, and his specimen, which constitutes the type of the species, is preserved in the Kew Herbarium.

From about that time, the plant has been grown in the Herbaceous Ground at Kew for over a hundred years, but it was not until comparatively recent times that it made its escape to become a naturalised alien. The Herbaceous Ground was extended in the early 1920's and much discarded material was removed to the rubbish tip in the Lower Nursery, where the plant became well established by 1925. It was first noticed outside the Gardens on Queen Elizabeth's Lawn in 1927, and since then it has spread in both directions along the Surrey side of the Thames embankment for a distance of about six miles between Richmond and Hammersmith.

It is a remarkable species, of great botanical interest, because, unlike our British bromes, it exhibits an alternating chasmogamous (open) and cleistogamous (closed) method of seasonal flowering. That is, any one plant can be observed to flower chasmogamously in the spring and early summer, undergo a short transition period of mixed chasmogamy and cleistogamy (in the same panicle) to full cleistogamous flowering during the remainder of the summer, and then, again, after another transition period of mixed cleistogamy and chasmogamy, revert to chasmogamous flowering in the autumn. This difference in the mode of flowering is generally thought to be associated with the seasonal variation in day-length, which also effects striking morphological differences in the flower itself.

The swollen lodicules of the chasmogamous flower, which cause the lemma and palea to part, reveal a pair of well-developed, freely exposed, feathery stigmas and large, canary-yellow anthers up to 7 mm. in length; whereas, in the cleistogamous flowers, the lodicules remain as flat, hyaline lobes, leaving the lemma and palea firmly closed at anthesis, enclosing the squashed, insignificantly small stigmas and anthers which only attain a

length of some 1·5 mm. Nonetheless, fertilisation and seed-production are equally successful in both forms of flower and with both methods of flowering.

It is interesting to see that this grass has also become very well established along another stretch of the Thames, namely at Oxford, where it made a similar escape from the Oxford Botanic Garden in the 1930's. In recent years it has been frequently found on rubbish tips at ports and docks all round the British Isles, and the recently established population on the banks of the River Dee at Chester would strongly suggest that, in a similar way to what has happened at Kew and Oxford, this alien brome is likely to continue spreading in lowland areas along river valleys to become a well recognised member of the British flora.

An account of this species is in preparation for the 'Biological Flora of the British Isles'.—*J. Kennedy-O'Byrne.*

CRYPTOGAMIA

LICHENES

LECANORACEAE

***Lecanora dispersa** (*Pers.*) *Röhl.*, f. **dispersa.** On concrete of pavilion by Tennis Courts, 23.xi.58, *J.L.G.* (Confirm. J. R. Laundon). Also abundant on wall of Herbarium, and on wall near tow-path.

***L. conizaeoïdes** *Nyl. ex Cromb.* Abundant on sandstone wall of Herbarium, 30.xi.58, *J.L.G.* (Confirm. J. R. Laundon). Also abundant on garden seats and many deciduous trees.

CALOPLACACEAE

***Caloplaca citrina** (*Hoffm.*) *Th. Fr.* On concrete of pavilion by Tennis Courts, 23.xi.58, *J.L.G.* (Det. J. R. Laundon). Also frequent on wall near tow-path, and on Herbarium.

CLADONIACEAE

Cladonia pyxidata (*L.*) *Hoffm.*, var. **chlorophaea** *Flörke.* Frequent on rocks in the Rock Garden, 7.vii.58, *J. R. Laundon & J.L.G.*; pathway near Tennis Courts, 23.xi.58, *J.L.G.* (Det. J. R. Laundon). [Cf. F.102].

C. fimbriata (*L.*) *Fr.*, f. **macra** (*Flörke*) *Cromb.* Scarce on rocks in the Rock Garden, 7.vii.58, *J. R. Laundon & J.L.G.*; pathway near Tennis Courts, 23.xi.58, *J.L.G.* (Det. J. R. Laundon). [Cf. F.102].

C. furcata (*Huds.*) *Schrad.* Pathway near Tennis Courts, 23.xi.58, *J.L.G.* (Det. J. R. Laundon). [F.102].

CHRYSOTRICHACEAE

***Lepraria aeruginosa** (*Weis*) *Sm.* On concrete of pavilion by Tennis Courts, 23.xi.58, *J.L.G.* (Confirm. J. R. Laundon). Also frequent on wall near tow-path, and abundant on wall near Director's Office.

FUNGI

Gasteromycetes

Sphaerobolaceae

Sphaerobolus stellatus (*Tode*) *Pers.* On *Osmunda* fibre in Orchid House, 21.vii.59, *P. F. Hunt.* [F.140.]

SCHIZOPHYTA (CYANOPHYCEAE)

Oscillatoriaceae

Oscillatoria tenuis *Ag.* In vast quantities in the Pond, colouring the water green, 20.viii.59, *E.M.-R.* (Det. Dr. R. W. Butcher). [F.211. Cf. XII, 375, 1911.]

Flora of Alberta.*—This is the first Flora to cover the entire area of this large Canadian province, and as such it is welcomed by overseas workers, but for them it has certain initial drawbacks. Not only is there no map, but also there are no introductory chapters describing the physical features, climate, vegetation and botanical history. For enlightenment on such matters the student is referred to the author's paper (1955) on the vegetation of Alberta which is listed among other important references (especially those to H. M. Raup's work in the north-east of the province) in the bibliography at the end of the book.

Another drawback, for some readers, is the alphabetical arrangement of both genera and species, which the author himself has come to prefer to the traditional method, 'mainly because of facility in locating genera within families and species within genera', but also because 'the alphabetical order obviates the necessity of numbers to designate genera and species, thus simplifying keys and giving cleaner pages throughout'. But, surely, it is just this numbering which is liked by both reviewers and students who wish to know, for instance, how many species of *Carex* occur in Alberta, without having to count, as here, the species names in the key or among the descriptions or in the index. And, surely again, most botanists like to have descriptions of related species side by side? The sole relief provided from this absence of numbers is in the extremely brief Tabular Classification on page 15, where we are given the totals by families, genera, species (1605) and subspecific categories of the *Pteridophyta* and *Spermatophyta* of Alberta.

Professor Moss, who has worked in the field of this province for 35 years, and has made over 12,000 collections of plants, is to be thanked for giving us this very useful manual of the flora of a region which, in his words, is a meeting ground of Boreal and Cordillerean floristic elements, while in the extreme north-east a transition from Boreal to Arctic begins.

N. Y. Sandwith

* *Flora of Alberta*, a Manual of Flowering Plants, Conifers, Ferns and Fern Allies found growing without cultivation in the province of Alberta, Canada. By E. H. Moss. Pp. vi, 546. University of Toronto Press and London: Oxford University Press. Price £4.

Pakistan grasses.*—This work contains keys to the tribes, genera and species of grasses recorded from Pakistan. The account of each tribe and genus is preceded by a short diagnosis, and a detailed description is given for each species. These descriptions follow a systematic sequence, but they might have been even more valuable had they been pruned of less essential detail, and so framed as to emphasize the features of diagnostic value or biological importance. Localities at which the species has been collected are cited, together with the collector's name; unfortunately the omission of the collector's number makes it difficult to consult the relevant herbarium sheet.

The typography is uneven, and the number of misprints generous. Some of them are misleading. Thus the lemmas of *Bromus* are described as bearing 'awns several, rarely 3', and a number of latin names are spelled wrongly. The line-drawings are poorly reproduced, partly because the thickness of line and manner of shading adopted are not suited to the method of reproduction.

As the authors point out very little is known of the ecology and habitat of Pakistan grasses, and it is to be hoped that this work will stimulate others to fill this gap in our knowledge.

W. D. Clayton

Seedlings of common weeds.†—This new Bulletin has been produced, as is stated in the publication notice, in order that weed seedlings may be identified as soon as they appear. Eighty seven weed species are described and illustrated and a key, which seems to work well enough, is given for their determination.

The chief criticism of the booklet seems to be a somewhat unbalanced choice of species, the outstanding examples perhaps being the inclusion of the rare casual *Brassica juncea* (L.) Czern. & Coss., while *Aethusa cynapium* L. is omitted. The author, Mr. R. J. Chancellor, states in the introduction that some species are omitted because seedlings could not be obtained, but this could hardly apply to Fool's Parsley; other examples could be quoted. The practical use of distinguishing seedlings of such species pairs as *Papaver dubium* L. and *P. rhoeas* L. is obscure, and it might have been better to give a general description such as, under *Lamium amplexicaule* L., justifiably serves to exclude *L. purpureum* L.

However, selection in a selective publication will always be a matter of personal opinion, and this booklet, which obviously embodies much careful work, will undoubtedly supply a long-felt want.

C. C. Townsend

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* *Grasses of West Pakistan.* By Sultan Ahmad & R. R. Stewart. Biological Society of Pakistan, Monograph No. 3. Part 1. Subfamily Panicoideae. Pp. vi + 151, 91 text-figures. Part 2. Subfamily Pooideae. Pp. 152–388, 98 text-figures. Lahore: Biological Society of Pakistan, part 1, 1958, part 2, 1959. Price: part 1, Rs. 15, part 2, Rs. 20.

† *Seedlings of common weeds.* By R. J. Chancellor. Ministry of Agriculture, Fisheries and Food Bulletin No. 179. Pp. 72, 117 line-drawings. London: Her Majesty's Stationery Office, 1959. Price 4s. 6d.

Notes on African *Asclepiadaceae*: IX*

A. A. Bullock

This series will continue to include the *Periplocaceae*; notes on that family will occupy a separate section at the end of each contribution. The present notes contain a further part of my redistribution of species hitherto referred to *Marsdenia*, together with some miscellaneous notes and records. Among the *Periplocaceae* I have resuscitated *Parquetina* Baill.; this name takes the place of *Omphalogonus* Baill. and the identity of the single species with *Periploca nigrescens* Afz. is postulated. In the *Asclepiadaceae* I have resuscitated *Rhynchostigma* Benth., whilst restricting its circumscription to a single species which is still somewhat imperfectly known; it is a third genus of the tribe *Secamoneae* (subfam. *Secamonoideae*), not a member of the tribe *Marsdenieae* (subfam. *Asclepiadoïdeae*), where it was originally placed by Bentham. The other two species of *Rhynchostigma* mentioned by Bentham were correctly transferred to *Toxocarpus* by N. E. Brown, but I here consider the two as conspecific.

In addition to my thanks to Mr. J. E. Dandy, Keeper of Botany at the British Museum, for continued permission freely to make use of the facilities and specimens of the herbarium in his charge, I am indebted to Prof. W. Robyns for the loan of material from Brussels.

ASCLEPIADACEAE

Toxocarpus Wight & Arn.

The genus *Toxocarpus* is largely Asiatic, but N. E. Brown (1902) was probably at least partly correct in transferring species of *Rhynchostigma* Benth. to it, just as Schumann (1895) was inaccurate in maintaining Bentham's three species of *Rhynchostigma* (see below).

Toxocarpus brevipes (Benth.) N. E. Br. is now represented at Kew by several specimens from Southern Nigeria, Cameroons, Congo Republic, Portuguese Congo, and Northern Rhodesia, but *T. parviflorus* (Benth.) N. E. Br. is still known from the type specimen only, collected by *Mann* (No. 983) in the Gabon in July 1861. The differential characters separating the two species are somewhat insignificant and the type of *T. parviflorus* may well be no more than a young specimen of *T. brevipes*; I prefer to treat it as such.

Toxocarpus brevipes (*Benth.*) *N. E. Br.* in Thiselton-Dyer, Fl. Trop. Afr. 4 (1): 287 (1902); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 54 (1931).

Rhynchostigma brevipes Benth. in Hook., Ic. Pl. 12: 78, sub t. 1189 (1876); K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 283 (1895).
R. parviflorum Benth., *l.c.*; K. Schum., *l.c.*
R. lujae De Wild. & Dur. in Bull. Soc. Roy. Bot. Belg. 38: 208 (1900).
Secamone rubiginosa K. Schum. in Engl., Bot. Jahrb. 23: 233 (1896).
Toxocarpus parviflorus (Benth.) N. E. Br., *l.c.* 288.

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* Continued from Kew Bull. 11: 522 (1957).

Southern Nigeria. Nun R.; 'climbing plant 5–7 m., calyx green, corolla white'; Sept. 1860 (fl.), *Mann* 484 (K; *lectotypus nominis speciei*). Nun R.; 'small twiner, flowers white'; *Barter* 2120 (K). Lagos, Inaya; 'creeper, flowers white'; Dec. 1892 (fl.), *Millen* 64 (K). Eket Distr.; *Talbot* 3031 (K). Lagos, Ikoyi Plains; Aug. 1912 (fl.), *Dalziel* 931 (K). Lagos Is.; *Dalziel* 1105 (K). Onitsha Prov., Awka Distr., Agulu, in *Acioa barteri* tangle; 'small liane, stems purplish brown, with white latex, leaves glaucous below, flowers cream, becoming yellow'; Nov. 1949 (fl.) *Keay in F.H.I.* 25590 (K). Ogoja Prov., Ikom Distr., between Bendiga Afi and Akparabong, in secondary forest regrowth; 'slender liane, leaves glossy dark above, very pale below, corolla white, turning yellow'; Dec. 1950 (fl.), *Keay in F.H.I.* 28271 (K).

French Cameroons. Without locality or date (fl.), *Preuss* 446 (K). Lolodorf; *Staudt* 365 (K; *isotypus nominis Secamone rubiginosa* K. Schum.). Batanga; 'twining vine with milky juice and some white and some yellow flowers'; July 1895 (fl.), *Bates* 329 (K). Bitya, near River Ja; (fl.), *Bates* 1758 (K). Bipinde; 1899 (sterile), *Zenker* 1955* (K).

Gabon. Gabon River, 1°N.; 'climbing plant'; July 1861 (fl.), *Mann* 983 (K; *holotypus nominis Rhynchostigma parviflorum* Benth.).

Congo Republic. Yangambi; May 1938 (sterile), *Louis* 9476 (K). Lituko Is., between Yangambi and Isangi; Dec. 1938 (fl.), *Louis* 13212 (K). Eala; Dec. 1943 (fl.), *Germain* 1796 (K). Lubefu Terr., near Lutanga; 'petite liane de 2 m. 50 cm. de haut'; June 1952 (fl.), *Germain* 7672 (K).

Portuguese Congo. Sumba, Peco, near the Congo R.; May 1926 (fl.), *Gossweiler* 9150 (K).

Northern Rhodesia. Mwinilunga Distr., 19 km. north of Mwinilunga Boma; 'scrambler, 6 m., over shrubs on dry side of fringing forest, with sweet scent'; June 1955 (fl.), *Holmes* 1153 (K).

Rhynchostigma Benth.

N. E. Brown's (1902) categorical statement '*Rhynchostigma* and *Toxocarpus* are certainly identical' is no more than half true, just as Schumann's (1895) adherence to Bentham's original circumscription was only half true. The latter, however, may have merely accepted Bentham's genus with its three species, without critical examination, for he failed to recognise *Toxocarpus brevipes* (Benth.) N. E. Br. in his own *Secamone rubiginosa*.

The type-species of *Rhynchostigma* is clearly *R. racemosum* Benth. and this, although still known from the type collection only, appears to be sufficiently distinct. The genus, originally placed by Bentham (1876) in the tribe *Marsdenieae*, was correctly transferred to the *Secamoneae* by N. E. Brown (1902)

Rhynchostigma racemosum *Benth.* in Hook., Ic. Pl. 12: 77, t. 1189 (1876), *lectotypus nominis generici*; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 283, fig. 85 *R-S* (1895).

Toxocarpus racemosus (Benth.) N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 287 (1902); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 54 (1931).

Cameroons. Cameroon Mt., 1350 m.; Feb. 1862 (fl.), *Mann* 1273 (K; *holotypus nominis speciei*).

Secamone R.Br.

The widespread Old World genus *Secamone* is represented by three species in the area of the 'Flora of West Tropical Africa'. *S. afzelii* (Schultes) K. Schum. appears to be a common plant of the humid forest, extending from Portuguese Guinea eastwards to the Cameroons and Gabon, but hitherto not recorded from any areas further east. Specimens collected in Portuguese Guinea in 1945 (*Esp. Santo* 2183, 2233) and in Guinea in 1949 (*Baldwin*

* This specimen was cited by N. E. Brown as *T. brevipes*, although it is sterile and the leaves exactly match those of the type-specimen of *T. parviflorus*. It had been labelled *Secamone rubiginosa* in Berlin.

13317) constitute new records for those countries. The specimens were not available to me in 1954 (see Kew Bull. 9: 586 (1955)) when I drew attention to the fact that the name *Secamone myrtifolia*, then in use for this species, must be abandoned.

The other two West African species appear to be either rare or neglected. *S. leonensis* (Scott Elliot) N. E. Br. is still known only from the type collection made by *Scott Elliot* (No. 5773) on Sugar Loaf Mountain, Sierra Leone; further collections are required to confirm the distinctness of this species. *S. africana* (Oliv.) Bullock, however, is a very common forest species of East Africa which is known also from the Congo Republic and Angola. The following is a new record extending its range into the area of the 'Flora of West Tropical Africa':—

Secamone africana (*Oliv.*) *Bullock* in Kew Bull. 8: 362 (1953).

British Cameroons. On a steep slope at the edge of tangle beside the crater lake Nyos, Bamenda District, 1050–1200 m.; 'climbing shrub, 5 m., flowers white, with yellow centre'; Aug. 1952 (fl.), *Savory* 344 (K; *ex herb. Univ. Coll. Ibadan*).

Stathmostelma K. Schum.

Stathmostelma crassinerve (*N. E. Br.*) *Bullock*, comb. nov.

Asclepias crassinervis N. E. Br. in Thiselton-Dyer, Fl. Cap. 4(1): 671 (1907).

Transvaal. Barberton: Lomati River; Nov. 1922, *Thorncroft* 1171 (K). Rehbokdraai, near Nelspruit, 3600 ft.; Jan. 1906, *Burtt Davy* 1629 (K).

Swaziland. 'In graminosis, in terra Middel Veld dicta, inter Bremersdorp et 'Mbabane, alt. 2300–4000 ped'; Jan. 1906, *H. Bolus* 12135 (K; *lectotypus nominis speciei*). 'Mbabane, open veldt; Jan. 1905, *Burtt Davy* 2775; 2830 (K).

The *Thorncroft* specimen cited above is repeated in the Kew Herbarium by specimens labelled '*Herbarium Burtt-Davyanum*' without number or date, and '*Ex herb. F. A. Rogers*' with the number 19174.

This constitutes a new generic record for South Africa. Dissection of the flowers at once reveals the elongated pollen masses and flattened caudicles characteristic of the genus *Stathmostelma*. Also characteristic are the elongate leaves, with a broad strong midrib.

Stathmostelma frommii *Schltr.*; Bullock in Kew Bull. 8: 56 (1953).

Tanganyika Territory. Ufipa Distr., Sumbawanga road, near Mpui, 1500 m., among roadside grasses; 'height 1 m., a tall coarse plant, flowers orange, with an unpleasant odour'; Dec. 1956 (fl.), *Richards* 7268 (K). Ufipa Distr., Lake Sundu, 1500 m.; Dec. 1958 (fl.), *Richards* 10257 (K).

Northern Rhodesia. Sunsu, Kalambo Farm, 1500 m., in loam soil among rocks, in open woodland; 'height 130 cm., flowers orange'; Jan. 1955 (fl.), *Richards* 3942 (K).

The *locus classicus* of this species 'bei Urungu und Msamoia' is between Lakes Tanganyika and Nyasa and must be somewhere between the two localities cited above. The writer collected this plant (No. 2185) at Sunsu in 1950, and it was observed at several places on the Ufipa plateau in 1950 and 1951. The fact that such a conspicuous plant has not been collected outside this relatively small area indicates that, although it is locally abundant, its total distribution is both restricted and relict. The fruit is not yet known, and it may well be that pollination is limited.

This is in striking contrast to its nearest ally *S. spectabile* (N. E. Br.) Schltr., a plant of similar habit but occupying somewhat more arid habitats from northern Tanganyika southwards to Nyasaland and Southern Rhodesia (see below). Both species have large brilliantly coloured flowers and it

seems unlikely that they can have been overlooked in localities visited by collectors at the proper time—a month to six weeks after the onset of the wet season.

Stathmostelma spectabile (*N. E. Br.*) *Schltr.*; Bullock in Kew Bull. 8: 56 (1953).

This species is perhaps one of the most distinct and easily recognisable of all African *Asclepiadaceae*. The following specimens are at Kew, and it will be noted that Dr. Pole-Evans' recent collection has extended its known range far to the south. No details of the distribution of the species have been given since those of N. E. Brown in the 'Flora of Tropical Africa' in 1903.

The follicles have never been described. They are elongate-fusiform in shape, erect on thickened pedicels, about 14 cm. long and 2 cm. in diameter at the middle, at first densely tomentellous but almost glabrous when mature; they have the appearance of being long-beaked when immature, but the beak becomes less pronounced as the fruit matures.

Tanganyika Territory. Kondoa Distr., Kinyasi Scarp, 1500 m., in *Terminalia–Brachystegia* savannah; 'a spectacular scarlet-flowered plant, erect to 60 cm. high, with milky latex'; Jan. 1928 (fl., fr.), *Burtt* 971 (K). Shinyanga Distr., Kizumbi Hill, 1200 m.; common locally in grassland, among rocks; 'very spectacular herb to 1 m. high, with brick-red flowers'; Jan. 1932 (fl.), *Burtt* 3515 (K). Near Shinyanga; Jan.–Feb. 1933 (fl.), *Bax* 184. Shinyanga, *Koritschoner* 1851 (K). Tabora; *Lindeman* 744 (K). Shinyanga; Jan. 1946 (fl.), *Bax ex Bally* 5017. S. Mbulu Distr., Mt. Hanang, Katish to Nangwa, 1920 m.; 'very locally dominant in *Themeda triandra–Sporobolus* grassland with *Microglossa oblongifolia*, *Lippia asperifolia* and *Lantana salviifolia* in *Acacia hockii–A. subalata–Thespesia garckeana* bushland in a dark reddish brown loam of volcanic origin on the foot slopes of the mountain; a perennial herb up to 1 m. tall with umbels of brick coloured flowers'; Feb. 1946 (fl.), *Greenway* 7566 (K). Lake Prov., Mwanza, Mbarika, 1140 m., on hillside among rocks; 'height 75 cms., flowers reddish'; May 1953 (fl.), *Tanner* 1391* (K).

Nyasaland. Without locality or date (fl.), *Buchanan* 441 (K), 553 (K; *lectotypus*). Magomera Mission, 900 m.; 1861 (fl.), *Waller* s.n. (K). Blantyre, Shiré Highlands; *Last* s.n. (K). Blantyre Distr., Matope, in scrub woodland; 'up to 1 m. tall, flowers dark orange-brown, centres with yellow-border'; Jan. 1956 (fl.), *G. Jackson* 1775. Zomba, N.A.Chikowu, Lambulira Village, Jan. 1958 (fl.), *G. Jackson* 2140 (K).

Northern Rhodesia. Abercorn Distr., Kawimbe†, among rocks at mountain top; 'sepals green, petals orange-maroon, corona reddish-orange'; Dec. 1958 (fl.), *Richards* 10374 (K).

Southern Rhodesia. Inyanga Distr., Inyanga North; Dec. 1951 (fl.), *Aylen in Govt. Herb. Salisbury* 35184 (K). Western Inyanga Distr., 1200 m.; erect herbaceous plant 60–100 cm. high with stout perennial rootstock; flowers bright red-maroon with yellow centre; Jan. 1960 (fl.), *Pole Evans*** 5820 (K).

Stathmostelma verdickii *De Wild.*; Bullock in Kew Bull. 8: 346 (1953).

I have identified the following specimen with De Wildeman's type; it represents a new specific record for Northern Rhodesia.

Northern Rhodesia. Mazabuka Distr., Choma, Mapanza, 1050 m., in open *Hyparrhenia* grassland with *Albizia* sp.; 'petals pale green at base, banded with violet about the middle, white at the top'; Feb. 1958 (fl.), *Robinson* 2760 (K).

Gongronema Decne.

The genus *Gongronema* Decne. (1844) was based upon *Gymnema* sect. *Gongronema* Endl. (1838) which included but one species, *Gymnema nepalense* Wall. This species, therefore, must be regarded as the type of the generic

* Mr. R. E. S. Tanner reports that the roots are pounded and boiled with milk; the supernatant fluid, after cooling, is taken as a very rapid and effective cure for diarrhoea.

**Dr. I. B. Pole Evans remarks (*in litt.*) that the plant is associated with ancient ruins and terraces. He adds, 'The plant sent to you had a long tapering root some 55 inches in length. The young plants start off with a swollen tuber much like a parsnip and then elongate later.'

† Formerly known and cited in botanical literature as 'Fwambo'.

name *Gongronema*, although Decaisne included three other [Asiatic] species certainly and two more doubtfully. Some of the species added by later authors seem to have little in common with *G. nepalense* and would be better placed elsewhere.

As early as 1849 Bentham recognized an African species of *Gongronema* which he described as *G. latifolium*, and he reiterated the occurrence of the genus in West Africa in his account of the *Asclepiadaceae* in the 'Genera Plantarum' (1876). All other authors, however, have referred *G. latifolium* to *Marsdenia* and it appears in the 'Flora of Tropical Africa' as *M. racemosa* K. Schum., although N. E. Brown was well aware of the earlier synonym.* Schumann at first failed to realize that his *Marsdenia racemosa*, described in 1893**, was conspecific with Bentham's plant, though both he and Schlechter independently corrected the error in 1900 and 1901.

Strangely enough, Bentham (1849) also described *Marsdenia leonensis* and *M. glabriflora* from West Africa. Both are based upon single poor specimens and I have been unable satisfactorily to distinguish them specifically one from another or from *Gongronema latifolium*. I have also transferred *Marsdenia taylorii* Schltr. & Rendle to *Gongronema* and reduced *M. cynanchoides* K. Schum. to its synonymy. At the same time I have, somewhat reluctantly, described as new *Gongronema obscurum*, a plant from the dry savannah of Ghana which is very nearly allied to *G. angolense* (N. E. Br.) Bullock. The latter is widely distributed in West Africa, but has not been recorded hitherto from Ghana.

The African species of *Gongronema* occupy fairly well-defined ecological niches. *G. latifolium* and *G. angolense* are plants of wet and dry forest respectively; *G. obscurum*, as stated above, is known only from the dry savannah of Ghana, and *G. taylorii* is confined to the relict forest areas of the eastern seaboard which may, however, penetrate far inland along low-lying river valleys.†

Gongronema *Decne.* in DC., Prodr. 8: 624 (1844); Benth. in Benth. & Hook. f., Gen. Pl. 2: 769 (1876); K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 287 (1895).

Gymnema sect. *Gongronema* Endl., Gen. Pl.: 595 (1838).
[*Marsdenia* auctt. p.p., non R. Br. (1809)].

Species lectotypica nominis generici: *G. nepalense* (Wall.) Decne. (*Gymnema nepalense* Wall.); Index Nom. Gen. 30/04538.

Clavis specierum africanarum

Folia basi profunde cordata vel truncato-rotundata (cataphyllaria interdum basi cuneata):
  Frutices scandentes; folia late ovata vel ovato-rotundata, apice acute acuminata; inflorescentiae divaricatim ramosae;
    Flores fasciculati, fasciculis paucifloris racemoso-dispositis:
      Folia basi profunde cordata, sinubus latis; pedicelli 2–4 mm. longi . . **latifolium**
      Folia basi leviter vel vix cordata; pedicelli longiores, circiter 6 mm. longi . **gazense**
    Flores ad apices ramorum inflorescentiarum subumbellatim dispositi; pedicelli 8–10 mm. vel ultra longa; folliculi coriacei, pilis patentibus plus minusve dense vestiti, ambitu lineares, circiter 10–11 cm. longi et 4 mm. diametro . . **angolense**
  Frutices erecti, pubescentes; folia triangulari-ovata vel plus minusve oblonga, apice apiculata sed haud acuminata . . . . . **obscurum**
Folia basi acute cuneata, glabrescentia, marginibus basin versus ciliata . . . . **taylorii**

* The later epithet was correct under the old 'Kew' rule.

**Gongronema welwitschii* K. Schum., described at the same time, was identified correctly by N. E. Brown (1903) as *Sphaerocodon obtusifolium* Benth.

† *G. gazense* also is a plant of riverine forest, but its distribution is insufficiently known for generalisation.

Gongronema latifolium *Benth.* in Hook., Niger Fl. 456 (1849); Walp., Ann. 3: 62 (1852–3); K. Schum. in Engl., Bot. Jahrb. 23: 236 (1896).

Marsdenia leonensis Benth., *l.c.*; Walp. *l.c.* 61; N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 424 (1903); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 60 (1931).

M. glabriflora Benth., *l.c.*; Walp. *l.c.*; N. E. Br., *l.c.*; Hutch. & J. M. Dalz., *l.c.*; non *Gongronema glabriflorum* Warb. (1891).

M. racemosa K. Schum., *l.c.* 17: 147 (1893); Dur. & Schinz, Études Fl. Congo, 1: 194 (1896); Hiern in Cat. Afr. Pl. Welw. 1: 692 (1898); N. E. Br., *l.c.* 425; Norman in Journ. Bot. 67, Suppl. 2: 97 (1929).

M. latifolia (Benth.) K. Schum. in Just, Jahresb. 26 (1): 372 (1900); Schltr., Westafr. Kautschuk-Exped.: 309 (1901); Dur., Syll. Fl. Congol.: 365 (1909); De Wild., Études Fl. Bangala et Ubangi (Pl. Thonn. Congol. Sér. 2): 371 (1911); Mildbr., Wiss. Ergebn. Deutsch. Zentr.-Afr.-Exped. 1910–11, 2: 14 (1922); Hutch. & J. M. Dalz., *l.c.*; J. M. Dalz., Useful Pl. W. Trop. Afr.: 388 (1937); Exell, Cat. Vasc. Pl. S. Tomé: 244 (1944); Bullock in Kew Bull. 9: 365 (1954), et *l.c.* 10: 287 (1955).

M. glabriflora var. *orbicularis* N. E. Br., *l.c.*

Senegal. Without locality or date; *Leprieur* s.n. (BM).

Portuguese Guinea. Catió; 'liane 3–6 m. flowers greenish cream'; July 1945 (fl.), *Santo* 2137 (K); June 1945 (fl.), *Santo* 2093 (K).

Guinea Republic. Near Macenta; April 1936 (fl.), *Jacques-Félix* 830 (K).

Sierra Leone. Waterloo; July 1914 (fl.), *Lane-Poole* 316. Mabonto, 550 ft.; Oct. 1914 (fr.), *N. W. Thomas* 3507 (K). Without locality or date; *N. W. Thomas* 3926. Yonibana; Oct. 1914 (fr.), *N. W. Thomas* 4131 (K). Fanima, near Njala; 'yellow-green flowers'; May 1927 (fl.), *Deighton* 681 (K); May 1929 (fl.), *Deighton* 1760 (K). Near Mano; 'common climber'; no date (fr.), *Deighton* 2428 (K). Loma Mts.; Aug. 1945, *Jaeger* 1342 (K); Sept. 1945 (fr.), *Jaeger* 1711 (K). Near Kambia, Magbema, among trees on edge of rocky stream; 'climber, woody at the base, flowers greenish yellow'; June 1951 (fl.), *Jordan* 447 (K). Makali; June 1955 (fl.), *Marmo* 26 (K), 49 (K). Rokupe, Magbema, in secondary bush; 'climber with milky juice, flowers green'; July 1959 (fl.), *Jordan* 1062 (K).

Liberia. Central Province, Sanokwele District, Zolopla; Sept. 1947 (fl.) *Baldwin* 9378 (K). Without locality, roadside, 300 m.; 'vine with lax panicles of greenish-yellow flowers'; no date (fl.), *Harley* 1171 (K). Ganta; March 1935 (fl.), *Harley* 406 (K); June 1935 (fl.), *Harley* 291 (K).

Ghana. Kwahu, 600 m.; 'climber with milky juice, flowers yellow'; April 1900 (fl.), *Johnson* 649 (K). Ashanti, in deciduous forest; without date (fl.), *Irvine* 506 (K). Ashanti Akim, Agogo, in deciduous forest; April 1928 (fl.), *Irvine* 965. Esheim, between Swedru and Saltpond, in secondary forest; April 1941 (fl.), *Milne-Redhead* 5052 (K; spirit collection). Tafo, Feb. 1954 (fl.), *Lovi* 3894. Agogo, pathside in secondary bush, 'twiner, flowers yellow'; April 1954 (fl.), *Adams* 2595 (K). On road down Mpraeso Scarp; April 1954 (fl.), *Morton* A.708 (K). Shiari Buem-Krachi Distr.; April 1959 (fl.), *Hall* 1408 (K). Togoland; without date, April (fl.), *Baumann* 465 (K).

Nigeria. 'Interior, Western Lagos'; 1893 (fl.) *Rowland* s.n. (K). Yoruba, Ikorodu; March 1899 (fl.), *Schlechter* 13000 (K). Oban; 1912 (fl.), *Talbot* 1004 (BM), 2072 (K). Sapoba, Erilogbe U.A.C. camp (Miboma), Beni, at roadside in high forest; Nov. 1943 (fr.), *Ejiofor in F.H.I.* 24664 (K). Ibadan South Forest Reserve, about 35 km. south of Ibadan near Ijobu-Ode road in margin tangle at edge of broken forest; 'herbaceous creeper with straggling stems up to 4 m. long, leaves erect, glossy dark green above, pale and almost glaucous green below, as are stems, inflorescence axis and calyx-lobes, corolla greenish yellow, anthers yellow'; April 1948 (fl.), *Keay in F.H.I.* 22842 (K). Ijobu District, Omo Forest Reserve, about 19 km. north of Grace Camp on road to Abeku; 'scrambling and twining half-shrub [with] green stems and yielding copious white exudate, calyx green, corolla yellow, anthers grey'; April 1953 (fl.), *Onochie in F.H.I.* 15546 (K). Onitsha, Udi, Olo; May 1956 (fl.), *Onochie in F.H.I.* 35853 (K). Ibadan, Gambari Group Forest Reserve; April 1956 (fl.), *Latilo et al. in F.H.I.* 34985 (K). Ankpa, Kabba Prov., Acharane forest reserve; 'a climber with yellow flowers'; June 1958 (fl.), *Daramola in F.H.I.* 38041 (K).

British Cameroons. Buea, 960 m., at edge of forest; April–May 1929 (fl.), *Maitland* 494, 705 (K).

Cameroun Republic. Bipinde; 1911 (fl.), *Zenker* 4047 (K). 'Weit nach Norden bis in den Bogen des Lom (Sanaga) vor der Vereinigung mit dem Djerem vorgeschobenen Auslaufer der geschlossenen Hylaea um Dengdeng etwa 250 km. NO Jaunde'; March 1914 (fl.),

Mildbraed 8540 (K). Sausane, 5° 30′N., 13° 45′E., about 750 m.; April 1914 (fl.), *Mildbraed* 9044 (K). Yaunde, Bitye; *Bates* 838 (BM), 1377 (BM).

S. Tomé. Without data; *G. Don* s.n. (K, *holotypus nominis speciei*).

Gabon. Nyanga district; 1914 (fl.), *Le Testu* 1889 (K).

Spanish Guinea. Nkotentangan; March 1908 (fl.), *Tessmann* 276 (K).

Congo Republic. Kivu, Kalehe, 850–900 m.; 'vers Km. 110 route Kavumu-Walikale, Irangi; forêt ombrophile; liane herbacée de 4 m. de haut; fleurs blanches'; Nov. 1957 (fl.) *Troupin* 4688 (K); Oct. 1957 (fl.), *Troupin* 4573 (K). 'En face d'Eala, rive droite Ruki, 370 m.; forêt primitive inondée au bord de la rivière; liane subligneuse à latex blanc, feuilles opposées, largement ovales, fortement cordées à la base, acuminées au sommet, pâles à la face inférieure avec réseau foncé et serré de nervilles, panicules axillaires de fleurs pentamères jaunes en ombellules, pétales un peu soyeux en-dedans, gynostégium à calotte blanche'; May 1936 (fl.), *Louis* 2051 (K, BR). 'Jeune plantation d'*Elaeis* sur terrain non incinéré, ± 470 m.; liane vimineuse, boutons floraux sphériques, corolle jaune, verte au centre, un peu charnue, gynostégium blanc, feuilles discolores, jaunâtres en-dessous'; Dec. 1937 (fl.), *Louis* 7257 (BR). 'Yangambi, km. 12 route de Ngazi, ± 470 m., lisière forêt primitive; herbe lianeuse volubile, feuilles vert sombre en dessus, vert jaunâtre en dessous, fleurs jaunes, le centre de la corolle vert, le gynostégium blanchâtre'; March 1938 (fl.), *Louis* 8635 (BR). Yambao, à 25 km. au N-W de Yangambi, ± 470 m., forêt primitive marécageuse au bord de la Longe; liane ligneuse grêle et volubile, fleurs blanchâtres'; April 1938 (fl.), *Louis* 8966 (BR). Yangambi, ± 470 m.; 'lisière forestière; liane vimineuse héliophile, fleurs jaune-verdâtre; April 1938 (fl.), *Louis* 9147 (BR). Yangambi, ± 470 m.; 'jachère après culture de riz; liane héliophile, vimineuse, volubile, fleurs inodores à corolle jaune-verdâtre, latex blanc'; May 1939 (fl.), *Louis* 14802 (BR). Ngazi, ± 470 m.; May 1939 (fl.), *Louis* 14808 (BR). Moganjale; Oct. 1941 (fl.), *Flamigny* 6143 (BR). Kisantu: Oct. 1955 (fl.), *Callens* 4456 (BR).

Uganda. Near Entebbe, Kitabulu forest, 1170 m.; 'climbing, 2·4–3.0 m., milky sap, flowers creamy white'; May 1935 (fl.), *Chandler* 1229 (K). Mulange, 1200 m.; 'flowers creamy, fragrant'; Jan.–Feb. 1920 (fl.), *Dummer* 4390 (K).

Angola. Lunda, Lulua river; *Pogge* 1249 (K, *ex mus. bot. Berol., isotypus nominis Marsdenia racemosa* K. Schum.). Queta Mountains, Golungo Alto, in the higher forests; 'shrub, climbing high and widely, with a soft pliant lactescent stem, glaucescent foliage and yellowish-white flowers'; Oct. 1855 (fl.), *Welwitch* 4228 (BM, K). Sange, Golungo Alto; *Welwitsch* 4229 (fr. BM, ster. K). Cammondai, Cazengo; 'corolla sulphur-yellow'; Nov. (fl.), *Gossweiler* 4702 (BM, K). Near Calunga, Golungo Alto; Nov. (fl.), *Gossweiler* 4843 (BM, K).

Northern Rhodesia. Lake Bangweolo, Chimana Dambo, near Samfya Mission; 'in dense mshitu, by stream, frequent, with *Ficus congensis*, *Syzygium cordatum*, *Rauwolfia*, *Mitragyna*, *Cephaëlis*, *Sabicea* and *Canthium* spp.; slender woody climber to about 12 ft., young stems green, older smooth, grey; leaves pale beneath with greenish-white midrib and lateral nerves; inflorescence axes deep purple, also calyx, but lobes pale; corolla greenish-yellow; stigma whitish; pollinia green; glands purple'; Oct. 1947 (fl.); *Brenan & Greenway* 8067. Fort Rosebery; Lake Bangweolo, forming part of dense undergrowth in *Syzygium elegans*, *Uapaca* sp. *Mitragyna* sp. swamp forest, 1·6 km. north of Samfya Mission; 'woody climber up to 6 or 7 m. high, stems thick, soft, pliable, about 2 cm. diam., fruits pale green'; Aug. 1952 (fr.), *Angus* 338 (K, ex FHO). *Ibid.*; 'slender climber with greenish-yellow flowers'; Sept. 1952 (fl.), *Angus* 360 (K, ex FHO).

Gongronema gazense (*S. Moore*) *Bullock*, comb. nov.

Marsdenia gazensis S. Moore in Journ. Bot. 46: 306 (1908).

Mozambique. Gazaland, Kurumadji, Jichu river, 600 m.; Jan. 1906 (fl.), *Swynnerton* 224 (BM, *holotypus*; K, *isotypus*). [Specimens collected by *Kirk* at Lupata and Tette are sterile, but may belong here].

A fruiting specimen (No. 5936) and flowering material (No. 5997) have been collected recently by Dr. I. B. Pole-Evans. These have enabled me to separate *G. gazense* from *G. latifolium*, but the two species are very closely allied to each other. The former is distinguished by its larger flowers and less deeply cordate leaves, which are often almost truncate at the base and never have the wide basal sinus of *G. latifolium*.

Gongronema angolense (*N. E. Br.*) *Bullock*, comb. nov.

Marsdenia angolensis N. E. Br. in Bull. Misc. Inf. Kew 1895: 258 (1895), & in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 423 (1903); Hiern in Cat. Afr. Pl. Welw. 1: 692 (1898); Mildbr., Wiss. Ergebn. Deutsch. Zentr.-Afr.-Exped. 1907–8,

2: 545, 618 (1913); Norman in Journ. Bot. 67, Suppl. 2: 97 (1929); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 60 (1931); Robyns, Fl. Sperm. Parc Nat. Albert 2: 107 (1947); Bullock in Kew Bull. 9: 366 (1954).

M. gondarensis Chiov. in Ann. di Bot. Roma 9: 80 (1911), *ex descr.*

Guinea Republic. 'Route de la base IFAN à N'Zérèkoré à 1 km. de la base'; Aug. 1954 (fl.), *Inst. d'Adiopodoumé* (Orson) 2614 (BR).

Sierre Leone. Yakala, 525 m.; Sept. 1914 (fl.) *N. W. Thomas* 2365 (K).

Ivory Coast. Nimba Mts.; Aug. 1953 (fl.), *Schnell* 6208 (K).

Nigeria. Bauchi Plateau; 'climbing herb with branched umbel-like inflorescences of greenish flowers'; July 1930 (fl.), *Lely* 515 (K).

Congo Republic. Rutshuru, in *Andropogon* savannah; 'flowers white'; Nov. 1914 (fl.) *Bequaert* 6246 (BR). Ruwenzori, Mutuanga, in the matete at the foot of the mountain; Aug. 1932 (fl.), *Hauman* s.n. (BR). Rutshuru, in fringing forest; 'liane with white latex and greenish-yellow flowers'; Jan. 1937 (fl.), *Ghesquière* 3599 (BR., *ex herb. J. Louis*). Bambesa; 1933 (fl.), *Bredo* s.n. (BR). Albert National Park, Rumangabo, in undergrowth of dry forest, about 1600 m.; 'woody twining liane, flowers yellowish-green, tip of the gynostegium white'; Dec. 1944 (fl.), *Germain* 3010 (BR). Kashaka Hill, between Goma and Sake, in dry forest; Jan. 1945 (fl.), *Germain* 3333 (BR). Kasongo District, Mobanga, in a forest remnant; 'small laticiferous liane'; June 1952 (fr.), *Germain* 7906 (BR). Vuma Forest, M'vuazi; 'liane abondante, feuilles opposées longuement petiolées, cordées et brièvement acuminées, inflorescences en petites cymes pedonculées'; Sept. 1951 (fl.), *Devred* 686 (BR, K).

Ruanda. Umhago, Bugesera, in wooded savannah; 'thick fleshy root, eaten by children'; March 1933 (fl.), *Becquet* 488 (BR).

Ethiopia. 'Dembia: Gondar, macchie tra i ruderi della citta'; Aug. (fl.), *Chiovenda* 1741 (*non vidi*).

Uganda. Unyoro, 1140 m.; 1905 (fl.), *Dawe* 767 (K). Mabira Forest; Aug. 1908 (fl.), *Ussher* 76 (K). Banda, 1200 m.; 'twiner in the forest edge, flowers cream'; Jan. 1914 (fl.), *Dummer* 681 (K). Near Kipango, 1200 m., in elephant-grass land; 'flowers greenish yellow'; May 1914 (fl.), *Dummer* 883 (K). Nkoko, 1200 m., in savannah; 'twiner, flowers ochre'; June 1916 (fl.), *Dummer* 2922 (K). Luvala, 1200 m., in bushland; 'flowers yellow ochre'; Sept. 1920 (fl.), *Dummer* 4482 (K). Buvuma Distr., Buzili; March 1925 (fl.), *Maitland* 1167 (K). Without locality or date (fl.), *Maitland* 1192 (K). Kyere Rock, 1080 m., at the base of the rock; 'clinging to neighbouring vegetation to a height of 12–15 ft. or more'; Dec. 1932 (fr.), *Chandler* 1045 (K). West Nile Distr., Logiri, in forest; 'climber, stems lactiferous, semi-succulent, flowers yellow-green'; March, 1935 (fl.), *Eggeling* 1859 (K). Ankole, Ruampara, near Mwizi, 1620 m., at forest edge; 'creeper, flowers yellow'; Jan. 1940 (fl.), *Eggeling* 3842 (K). Buganda, Mengo, Kyagwe, Kabira Forest, near Mulange, 1200 m.; Aug. 1950 (fl.), *Dawkins** 624 (K).

Kenya. Sotik, Kibajet estate, 1800 m., at forest edge; 'climber, flowers cream'; Sept. 1949 (fl.), *Bally* 7472 (K). Elgon Nyanza, Kuiwa River, 1350 m., on wooded bank of river in savannah with good rainfall; 'creeper to 5 m., flowers green with white centre'; Aug. 1959 (fl.), *Tweedie* 1886 (K).

Tanganyika Territory. Mbeya/Rungwe Distr., between Igale and Rungwe; Jan. 1913 (fl.), *Stolz* 548 (K).

Angola. Pungo Andongo, in thickets in the Praesidium at Cambondo; (fl.) *Welwitsch* 4245 (K,—*lectotypus nominis speciei*). Huilla, in woods to the west of Lopollo, 1560 m.; (fl.), *Welwitsch* 4250. Golungo Alto; (fr.), *Welwitsch* 4254. Loanda, Cazengo; (fl., fr.) *Gossweiler* 717, 4419, 4589, 4647.

Southern Rhodesia. Umtali, 1500 m.; Oct. 1951 (fl.), *Chase* 4144. Near Salisbury; Dec. 1936 (fl.), *Eyles* 8828. Nuza Plateau; 1934 (fl.), *Gilliland* K1288 (K).

Gongronema obscurum *Bullock*, sp. nov., inter species congeneras africanas *G. angolensi* (N. E. Br.) Bullock affinis, sed caulibus numerosis erectis vix scandentibus, foliis apice apiculatis sed haud acuminatis basi plerumque

* Mr. H. C. Dawkins has given the following additional notes:—'About 4 miles SE. of Mulange Hill, in grassy past-cultivated patch known as Kalangala, south of [the] Jinji-Bugerere road. Sloping hill-side site, on yellow-brown clay-loam soil over dolerite, found as decomposing fragments at 30 cm. depth. Climber on shrubs and trees at the forest edge where this is spreading into grassland. Associated with *Toddalia, Acacia pennata, Salacia elegans, Hippocratea, Pterolobium lacerans*, on *Teclea, Combretum gueinzii, Clausena anisata, Albizia grandibracteata*. Not reached by grass fires; under shade. Occasional throughout similar sites around the Mabira [Forest]. Liane, here only in very young stage 3 m. high but known also to reach upper canopy of high forest. All parts latex-bearing. Flowers entirely green but stigma (*sic*) and anthers paler than the rest. Twining direction as right-hand [screw] thread.'

truncatis vel rarius late cordatis sed haud profunde cordatis, inflorescentiis pro rata paucifloris haud diffuse ramosis facile distinguitur.

Suffrutex erectus, caulibus interdum demum subvolubilibus; caules numerosi e rhizomate lignoso orti, basi usque 3–4 mm. diametro, dense molliter brunneo-pubescentes, internodiis basin versus circiter 1·5–2 cm. longis superne usque 6 cm. vel ultra longis. *Folia* basalia cataphyllaria, superne satis longe petiolata, petiolis 2–4·5 cm. longis brunneo-pubescentibus supra canaliculatis; lamina ovata vel triangulari-ovata vel elliptico-ovata, usque 7 cm. longa et 4·5 cm. lata sed saepe minor, utrinque (subtus densius) molliter pubescentia, apice rotundata vel subacuta vel interdum acuta saepissime brevissime apiculata, basi truncata vel latissime cordata vel rarius (cataphyllaria tantum) cuneatim angustata, nervis lateralibus arcuatis utraque 3–4. *Cymae* sympodialiter laterales, breviter (circiter 2–4 mm.) pedunculatae, 2–3 ramosae, ramis brevissimis apice floribus brevissime pedicellatis in fasciculas subglobosas circiter 1·5 cm. diametro congestis, omnibus partibus satis dense brunneo-pubescentibus. *Calyx* fere ad basin 5 lobatus; lobi oblongi, apice rotundati, 2·5 mm. longi, 1·5 mm. lati, extra pubescentes et conspicue ciliati, intus glabri. *Corolla* suburceolata, 5 mm. longa, 3 mm. diametro, extra glabra, tubo intus (basi excepta) pilis reflexis sericeis induto, areolis 5 infra sinus glabris; lobi erecti, oblongo-ovati, 2 mm. longi, basi fere 1·5 mm. lati, marginibus ciliati. *Gynostegium* 3 mm. altum. *Coronae* lobi basi gynostegii adnati, superne liberi, erecti, oblongi, fere 0·75 mm. longi. *Alae* antherarum triangulares. *Appendices* antherarum membranaceae, transverse ellipticae, apice leviter emarginatae. *Stylus* apice obtuse conicus, spongiosus, morelliformis. *Folliculi* non visi sed ex cl. *Adamsio* juveniles pubescentes.

Ghana. Dedora, Tankara Forest Reserve, Narrongo District, Northern Territory, in wet area of savannah; 'climber with yellow flowers'; June 1954 (fl.), *Andoh* 5905 (*holotypus in herb. Kew.*). Salaga, Northern Territory, 210 m., in savannah forest; 'a herb two feet high with woody rootstock'; June 1935 (fl.), *Vigne* 3891. Near Wa, among grasses; 'many softly hairy stems, woody at the base, from a woody rhizome with long horizontally spreading roots, at first erect, becoming twining, juice milky, corolla-lobes yellow, flower [centre] green and purple, young fruit pubescent'; June 1951 (fl.), *Adams* 768. Near rest house, Yendi; 'climber, leaves very hairy, flowers yellow'; May 1936 (fl.), *Akpabla* 559.

I have described this species with some hesitation; the four specimens cited are certainly very much alike and are sufficiently different in facies from all the numerous specimens of *G. angolense* which I have seen. The differences may well be of the same kind, however, as those which I have considered insufficient to separate *Marsdenia leonensis* and *M. glabriflora* from *G. latifolium*, and the specimens will then represent no more than an ecotypical form of *G. angolense*. The point is one which can be settled finally only by further field observations. If it will survive such treatment, the new growths of *G. angolense* after bush clearance or burning would provide strictly comparable specimens.

Gongronema taylorii (*Schltr. & Rendle*) *Bullock*, comb. nov.

Marsdenia taylori Schltr. & Rendle in Journ. Bot. 34: 100 (1896); N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 422 (1903).

M. cynanchoïdes Schltr. in Engl., Bot. Jahrb. 38: 53, fig. 10 (1905).

Kenya Colony. Rabai Hills, near Mombasa; July–Sept. 1885 (fl.), *Taylor* s.n. (*holotypus, in herb. Mus. Brit.*).

Tanganyika Territory. Lindi Distr.; 'Lutamba-See, ca. 240 m. ü. M.—Lichter Wald, Schlinger in grossen Gruppen auf Sträuchern, Blüte gelb, Milchsaft; Oct. 1934 (fl.), *Schlieben* 5564 (K).

Mozambique. 'In den Wäldern bei 25-Miles-Station, im Beira-Hinterlande, ca. 60 m. ü. M.'; April 1898 (fl.), *Schlechter* 12243 (*isotypus nominis Marsdenia cynanchoïdes, in herb. Kew.*).

Southern Rhodesia. Lower Sabi Valley (288 km. from Umtali); May 1959 (fr.), Jan. 196 (fl.), *Pole Evans* 5718 (K)*.

The somewhat widely separated localities cited above indicate that *Gongronema taylorii* is probably a somewhat inconspicuous climber which has been largely overlooked. It may be noted that the flora of the eastern coastal forests of tropical Africa, which consist of relict patches, frequently includes species not found elsewhere and not found in all of the remaining areas of forest. These forest areas would well repay more detailed floristic examination. Dr. Pole Evans' recent discovery of the plant in the valley of the Sabi River is remarkable and demonstrates the intrusion of the coastal forest along a low-lying river valley.

Anisopus N. E. Br.

The following is a new record for the Congo Republic:—

Anisopus rostriferus (*N. E. Br.*) *Bullock* in Kew Bull. 11: 512 (1957).

Congo Republic. Opala, on the Lomani river, about 470 m., in secondary forest; twining semi-heliophilous liane with white latex; Feb. 1939 (fl.), *Louis* 14203 (BR).

Tylophora R. Br.

Tylophora adalinae *K. Schum.* in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 286 (*ante* 21 Oct. 1895); N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 410 (1903), *sub sp. imperf. conn.*

Marsdenia profusa N. E. Br. in Bull. Misc. Inf. Kew 1895: 258 (26 Oct. 1895), et in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 425 (1903); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 60 (1931).

I see no reason to doubt the correctness of N. E. Brown's (*l.c.* 410 (1903)) suggestion that *Tylophora adalinae* and *Marsdenia profusa* refer to the same species, and I prefer Schumann's judgment as to the correct genus. It is represented at Kew only by the *Barter* specimen (No. 16, type of *Marsdenia profusa*) from the Brass River, Nigeria, and the species must be regarded as imperfectly known. Barter noted that it was 'twining on shrubs and trees, with a profusion of white flowers.'

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* Dr. I. B. Pole-Evans has kindly supplied the following notes:—'The plant as I saw it was a slender to medium sized twiner growing in bush covered country with a fairly dense grass cover below. It was growing in very fine, loose, and deep sand. The vegetation was clearly subjected to fierce fires year after year.

'The root system was very different from that of other *Marsdenias* that I have so far examined. It reminded me more of a Monocotyledonous plant such as a *Chlorophytum* than of an *Asclepiad*. The root system was composed of a bundle of fleshy roots fairly closely packed together, the roots being of a uniform thickness, about $\frac{1}{4}$" in diameter and 12-18 inches long. The plant was growing some 400–500 yards from the banks of the Sabi river.

'The associated trees were *Acacia nigrescens, Sclerocarya caffra, Brachystegia tamarindoïdes, Julbernardia globiflora, Afzelia quanzensis, Gardenia spatulifolia, Terminalia prunoïdes*, and *Terminalia sericea*, while typical shrubs were *Fluggea virosa, Combretum hereroënse, Bridelia mollis, Cladostemon kirkii* and *Grewia* spp. The grass cover was composed mainly of *Aristida* spp. and *Panicum maximum*'.

PERIPLOCACEAE

Zacateza Bullock

The following is a new record for this monotypic genus; previous specimens have been collected in Southern Nigeria and the north-eastern parts of the Congo Republic:—

Zacateza pedicellata (*K. Schum.*) *Bullock* in Kew Bull. 9: 361 (1954).

Angola. Dundo, near the river Luachimo, North-east Lunda; 'climber in gallery woods; stems softly woody, much divided from the base, 4 m. high, corolla greenish white'; 14 Oct. 1946 (fl.), *Gossweiler* 13684 (K).

Mondia Skeels

The generic name *Chlorocodon* Hook. f. (1871) is illegitimate, being a later homonym of *Chlorocodon* Fourreau (1869). A proposal for conservation (Bullock in Taxon 3: 67 (1954)), however, has been rejected by the committee for Spermatophyta (see Taxon 9: 16, 17 (1960)), and this well-known name must give place to *Mondia* Skeels (U.S. Dept. Agric. Bur. Pl. Ind. Bull. No. 223: 45 (1911)).

Only two species have been recognized. *M. whitei* (Hook. f.) Skeels is widespread in Africa from Portuguese Guinea in the west through the Sudan to Uganda, Kenya and Tanganyika southwards to Natal and westwards again to Angola. *M. ecornuta* (N. E. Br.) Bullock*, on the other hand, is strictly confined to the relict forest of the eastern coast. The holotype and only specimen from the area was collected at Ribe, near Mombasa; from the Tanganyika coastal forest there are several specimens in the Kew Herbarium, and one from Mozambique. The species was described in 1895. As has frequently happened, the widespread species has been described several times and its synonymy has never been given completely.

Mondia whitei (*Hook. f.*) *Skeels* in U.S. Dep. Agric. Bur. Pl. Ind. Bull. No. 223: 45 (1911).

Chlorocodon whitei Hook. f. in Bot. Mag. 97, t. 5898 (1871); K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 215, 217, fig. 64 O–Q (1895); Masters (Ed.) in Gard. Chron., Ser. 3, 18: 234, 243, fig. 48 (1895); Schltr. in Journ. Bot. 34: 314 (1896); Hiern in Cat. Afr. Pl. Welw. 1: 680 (1898); Wood & Evans, Natal Pl. 1: 27, t. 31 (1898); N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 255 (1902) & in Thiselton-Dyer, Fl. Cap. 4(1): 542 (1907); Bullock in Kew Bull. 9: 351 (1954).

Periploca latifolia K. Schum. in Engl., Pflanzenw. Ost-Afr. C: 321 (1895) & in Engl., Bot. Jahrb. 23: 232 (1896).

Tacazzea amplifolia S. Moore in Journ. Bot. 50: 337 (1912).

T. viridis A. Chev. (Expl. Bot. Afr. Occid. Franç.: 429 (1920), *nomen*) ex Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 52 (1931), *descr. angl. in clavi*, & in Bull. Misc. Inf. Kew 1937: 339 (1937), *descr. lat.*

Batesanthus N. E. Br.

When he described the genus *Batesanthus* in 1896, N. E. Brown saw only one specimen, collected by *Bates* near Efulen in the Cameroons. Additional

* **Mondia ecornuta** (*N. E. Br.*) *Bullock*, comb. nov.—*Chlorocodon ecornutus* N. E. Br. in Bull. Misc. Inf. Kew 1895: 111 (1895), ubi err. '*ecornuta*'.

material accumulated very slowly, and by 1902, when Brown published his account of the genus in the 'Flora of Tropical Africa', only two specimens were known to him. The second of these, collected by *Klaine* at Libreville (Gabon), enabled Brown to reduce the inadequately described *Perithryx* Pierre (1898).

Four more names of alleged new species of *Batesanthus* have appeared—*B. talbotii* S. Moore (1913), *B. intrusus* S. Moore (1920), *B. mildbraedii* Schltr. (1922) and *B. parviflorus* Norman (1929), and in addition *B. talbotii* var. *grandifolius* was also described by S. Moore (1913) and he thought that it probably represented another new species. With the exception of *B. parviflorus*, a plant of Angola, all the 'species' concerned, and all the somewhat sparse additional material of them, were collected in the rain forest of southern Nigeria, Cameroons, Gabon and adjacent Congo Republic. It has become necessary to examine the alleged specific differences between them, bearing in mind the restricted distribution and the physiological age of the available herbarium specimens. It is also noteworthy that no collector appears to have found more than one of the 'species'.

The first important difference between the original *B. purpureus* and the other species is that the former is said to have larger flowers; no-one, however, seems to have remarked that the type specimen is the only known specimen of the genus showing fully mature, open flowers. *B. intrusus* S. Moore shows even smaller flowers than *B. talbotii* S. Moore; they are correspondingly younger and the so-called 'intrusion' is entirely due to the fact that the buds examined are at a very early stage of development. Further, S. Moore's *B. talbotii* var. *grandifolia* which 'looks very different and should possibly be regarded as a distinct species' is distinguished from the type variety as follows:—*A typo discrepans ob folia majora, sicca fusca, necnon corollas majores.* Here then is a form with flowers (and leaves) intermediate in size between those of *B. purpureus* and *B. talbotii.*

There is in fact no combination of characters hitherto observed which will serve to distinguish these plants specifically and I have decided to publish the following new synonymy:—

Batesanthus purpureus *N. E. Br.* in Hook., Ic. Pl. 25, t. 2500 (1896), & in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 254 (1902); K. Schum. in Engl. & Prantl, Nat. Pflanzenfam., Nachtr. 286 (1897), et *op. cit.* Nachtr. 2: 60 (1900).

Perithryx glabra Pierre in Bull. Soc. Linn. Paris, nouv. sér. No. 8: 66 (1898).
Batesanthus talbotii S. Moore in Cat. Talb. Nig. Pl. 63 (1913); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 53 (1931).
B. talbotii var. *grandifolia* S. Moore, *l.c.* 64.
B. intrusus S. Moore in Journ. Bot. 58: 267 (1920).
B. mildbraedii Schltr. in Mildbr., Wiss. Ergebn. Deutsch. Zentr.-Afr.-Exped. 1910–11, 2: 80 (1922), *nomen tantum.*
B. talbotii var. *parviflora* S. Moore, *nomen in herb. Kew.*; Hutch. & J. M. Dalz., *l.c. in syn.*

Parquetina Baill.

The genus *Parquetina* was somewhat inadequately described by Baillon to accommodate a plant from the Gabon collected in 1883 by Duparquet. The description appeared on p. 806 in Bulletin No. 101 (Séance du 6 Nov-

embre 1889) of the Société Linnéenne de Paris and it is evident that the Bulletin was issued very soon after the meeting. Bulletin No. 102 (Séance du 3 Décembre 1889) contained (p. 812) Baillon's description of *Omphalogonus calophyllus*, a plant from Zanzibar. The two genera were maintained in volume ten (p. 294 and p. 300 respectively) of Baillon's 'Histoire des Plantes' (1891).

In his revision of tropical African *Asclepiadaceae* in the 'Flora of Tropical Africa', N. E. Brown recognized *Parquetina gabonica* Baill. as *Periploca nigrescens* Afz. but owing to Baillon's meagre and somewhat faulty description he maintained *Omphalogonus calophyllus* as a distinct monotypic genus, unknown to him but apparently 'allied to *Chlorocodon*'. Later, Brown was able to examine material of *Omphalogonus calophyllus*, but he failed to recognize it as *Periploca nigrescens*; he also recognized certain West African specimens as congeneric with Baillon's plant, and proceeded to describe them (1912) as *Omphalogonus nigritanus*. Hua's (1905) contribution gave every reason for recognizing the identity of *Periploca nigrescens* with *Omphalogonus callophyllus*, but in fact failed to do so!

It is perhaps unfortunate that *Parquetina* antedates *Omphalogonus*, but the necessary new name will focus attention on a minor taxonomic confusion which is now resolved.

Parquetina nigrescens (*Afz.*) *Bullock*, comb. nov.

Periploca nigrescens Afz., Stirp. Guin. Med. Sp. Nov. 1: 2 (1817); K. Schum. in Engl., Bot. Jahrb. 23: 232 (1896); Hiern in Cat. Afr. Pl. Welw. 1: 681 (1898); N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 258 (1902); De Wild., Not. Pl. Ut. Congo 2(1): 83, fig. 5, tt. 21–22 (1906); Hua in Bull. Soc. Bot. France 52: 268–275, cum fig., t. 3 (1905); Th. & H. Dur., Syll. Fl. Congol.: 357 (1909); De Wild., Pl. Thonn. Congol., Sér. 2: 370 (1911); A. Chev., Expl. Bot. Afr. Occ. Franç. 1: 430 (1920); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 52 (1931); Robyns, Fl. Sperm. Parc Nat. Albert 2: 85 (1947); Roberty, Petite Fl. Ouest Afr.: 100 (1954).

P. afzelii G. Don, Gen. Syst. 4: 163 (1838).

Parquetina gabonica Baill. in Bull. Soc. Linn. Paris 2(101): 806 (1889) & Hist. Pl. 10: 294 (1891), *typus nominis generici.*

Omphalogonus calophyllus Baill. in Bull. Soc. Linn. Paris 2(102): 812 (1889) & Hist. Pl. 10: 300 (1891), *typus nominis generici*; K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 221 (1895); N. E. Br. in Thiselton-Dyer, Fl. Trop. Afr. 4(1): 256 (1902), *ex descr.*; Hua in Bull. Soc. Bot. France 52: 268–275, cum fig., t. 3 (1905); A. Chev., Expl. Bot. Afr. Occ. Franç.: 430 (1920); Brenan, Trees Shrubs Tanganyika Terr. (2): 67 (1949).

Periploca preussii K. Schum. in Engl., Bot. Jahrb. 17: 117 (1893) & in Engl. & Prantl, Nat. Pflanzenfam. IV. 2: 216, 217, fig. 64 R-V (1895); De Wild. & Th. Dur., Contr. Fl. Congo in Ann. Mus. Congo, Sér. 2, 1(2): 41 (1900).

P. nigricans Schltr., Westafr. Kautschuk-Exped. 308: (1900), *err. orth.*

Omphalogonus nigricans N. E. Br. in Bull. Misc. Inf. Kew 1912: 279 (1912); Hutch. & J. M. Dalz., Fl. W. Trop. Afr. 2: 53 (1931).

Periploca wildemanii A. Chev., Études Fl. Afr. Centr. Franç. 1: 197 (1913), *nomen.*

P. gabonica (Baill.) A. Chev. in Rev. Bot. Appliq. 31: 251 (1951), *in obs.*

Periploca calophylla (Baill.) Roberty in Bull. Inst. Franç. Afr. Noire 15: 1429 (1953) & Petite Fl. Ouest-Afr.: 100 (1954).

There is now material of this species in the Kew herbarium from Portuguese Guinea, Republic of Guinea, Sierra Leone, Liberia, Ghana, Dahomey, Nigeria, Cameroons, Gabon, the Congo Republics, Sudan, Uganda, Kenya, Tanganyika, Zanzibar and Angola. Throughout this great geographical range, the plant is a forest climber, showing some considerable variation in leaf shape and size. There is also some evidence of sexual dimorphy amounting almost to dioecism.

It has been observed* that some plants never produce fruit; these have relatively small flowers with well-developed anthers and poorly-developed carpels; the pollen is discharged on to large pollen carriers. Other plants—and these are presumably fruit-bearing—have larger flowers, well developed carpels but smaller stamens and pollen carriers, and very little pollen. Collectors, particularly in western tropical Africa, have been unable to distinguish more than one species in the field, but further observations are required in order to establish completely the accuracy of the synonymy given above.

Further note on Labisia pumila (Bl.) F.-Vill. (Myrsinaceae).— In Kew Bull. 14(2): 320 (Sept. 1960), I published a note indicating some apparently necessary name-changes in this genus, consequent upon the establishment of the dates of publication of certain works of Reinwardt and Blume by Dr. van Steenis in Fl. Males. Bull. 1(4): 109 (1948). Upon reading my note, Dr. van Steenis has written to me to say that it has more recently come to his notice that the name *Ardisia pumila* Bl. (the basis of *Labisia pumila* (Bl.) F.-Vill.) was first published in Blume's 'Catalogus van eenige der merkwaardigste zoo in- als uit-heemsche Gewassen, te vinden in 's Lands Plantentuin te Buitenzorg': 44 (1823), thus antedating both Reinwardt's *Angiopetalum punctatum* (1825), as well as Blume's own later description of *Ardisia pumila* in the 'Bijdrage' (1826), in which he makes no reference to the 'Catalogus'.

The name-changes indicated in my note prove therefore to have been unnecessary. Dr. van Steenis draws attention to the short article by Dr. G. H. M. Lawrence in 'Baileya' 8: 52–53 (July 1960), in which the new names published in Blume's 'Catalogus', but not yet entered as such in the 'Index Kewensis', are conveniently listed. I had in fact overlooked this, but it is in any case probable that by the time it was received at Kew it would have been too late to withdraw my note from the 'Kew Bulletin'.

H. K. Airy Shaw

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* Oral communications, and in personal letters from various recent collectors.

Notes on African *Commelinaceae* : III*

J. P. M. Brenan

Commelina L.

Commelina (Subgen. *Didymoön*, Sect. '*Eu-Commelina*') **pycnospatha** *Brenan*, sp. nov.; affinis ut videtur *C. trilobospermae* K. Schum., marginibus vaginarum spatharumque haud longe ciliatis, spathis plerumque confertioribus haud deorsum deflexis, seminibus reniformibus distat; a *C. diffusa* Burm. f. et *C. sabatieri* C. B. Cl. spathis parvis subsessilibus in ramulis ultimis congestis et fere imbricatis, floribus haud exsertis, petalis superioribus pallide luteis, seminibus foveolatis facile distinguenda.

Herba prostrata, usque ad 35 cm. vel ultra longa, radicibus fibrosis e nodis ortis. *Caules* crebre ramosi, satis graciles, inconspicue et unilateraliter puberuli, demum subglabri, internodiis inferioribus plerumque 3–5·5 cm. longis. *Folia* papyracea, inferiora lanceolata vel elliptica, superiora ovata, 2·4[–6] cm. longa, 0·9–1·5[–1·8] cm. lata, omnia apice acuta vel superiora subacuta, basi rotundata sed nec subcordata nec amplectentia, utrinque glabra vel sparsissime puberula, margine arcte et minutissime serrulata; folia suprema spathas subtendentia reducta, ovata, circiter 0·8–2 cm. longa; vaginae usque ad 7[–13] mm. longae, superiores laxae, albidae, margine breviter et inconspicue albido-ciliatae. *Spathae* singulatim ex axillis superioribus ortae sed in ramulis ultimis quorum internodia brevissima cum foliis reductis congestae et fere imbricatae, subsessiles, circiter 1·2–1·6 cm. longae, 0·6–0·9 cm. latae, a latere visae subtus concavae hinc subfalcatae supra late rotundatae et basi subcordatae, apice subacutae, imo basi sparse et inconspicue puberulae aliter glabrae, pallide virides, marginibus ad basin liberis. *Flores* parvi, in spatha inclusi, marcidi tantum visi. *Sepala* circiter 2·5 mm. longa. *Ovula* 5. *Stylus* circiter 5 mm. longus. *Capsula* circiter 4·5 mm. longa, 3 mm. lata, apice apiculata, loculo dorsali seminifero dehiscente, loculis ventralibus uniseminiferis cum 1 ovulo abortivo, raro biseminiferis: capsula hinc 3–4-sperma. *Semina* griseo-brunnea, reniformia, 2–2·3 mm. longa, 1·3–1·75 mm. lata, testa foveolata et papillis albidis circum foveolas plus minusve reticulatim dispositis ornata.

Northern Rhodesia. Mporokoso District: Bulayo–Sambu road, Mweru-Wantipa, damp sandy soil by stream at top of bridge, 5 Apr. 1957, *Mrs. Richards* 9042 (K, holotype):— creeping, rooting at nodes; tiny flowers; lower petal transparent, upper pale lemon-yellow. Livingstone District: Bombwe forest, 1934, *J. D. Martin* 568.

Martin 568 had lain many years unmatched in the Kew Herbarium, until Mrs. Richards's recent gathering was added.

In the peculiar arrangement of the almost sessile spathes there is a distinct resemblance to *C. trilobosperma* K. Schum., as interpreted *e descriptione* (e.g. *B. D. Burtt* 2425, from Tanganyika), but *C. pycnospatha* differs in the margins of the leaf-sheaths and spathes lacking long and conspicuous cilia, in the spathes not being so deflexed that their apices point almost vertically downwards (as they are in *C. trilobosperma*), in the spathes being usually less

* Continued from Kew Bull. 14: 286 (1960).

crowded, and in the reniform, not trilobed seeds. There is probably also a difference in flower-colour: *C. pycnospatha* has pale lemon-yellow upper petals and a transparent lower one, while *C. trilobosperma* has flowers variously described as pale pinky-brown, orange, and yellow-orange.

C. pycnospatha shows some resemblance in habit, foliage, spathe-shape and capsule to *C. diffusa* Burm. f. and *C. sabatieri* C. B. Cl., differing in the strange way in which the almost sessile spathes with their reduced subtending leaves are bunched several together, almost imbricate so close are they, on the ultimate branches of the plant; in the included flowers; in the petals being yellow or hyaline, not blue; and in the foveolate seeds.

Commelina (Subgen. *Didymoön*, Sect. '*Eu-Commelina*') **reptans** *Brenan*, sp. nov.; affinis ut videtur *C. purpureae* C. B. Cl. sed caulibus reptantibus et geniculatis, foliis saepius falcatis et latioribus, spathis plerumque manifeste pedunculatis et majoribus differt.

Herba perennis, caulibus e caudice ortis reptantibus usque ad circiter 45 cm. longis, internodiis plus minusve arcuatis, nodis plerumque conspicue geniculatis et radices fibrosas saepe emittentibus; [nonnunquam caules alii nonnulli suberecti usque ad circiter 23 cm. alti additi;] radices etiam e caudice radiantes, fusiformi-incrassatae, usque ad circiter 9 cm. longae. *Caules* simplices vel ramosi, glabri vel praesertim prope nodos breviter pubescentes [vel nonnunquam ubique satis dense pubescentes], internodiis plerumque 5–12[–15] cm. longis, basalibus brevioribus. *Folia* caulina lanceolata usque lineari-lanceolata, plerumque falcata, 2–3·5[–7·5(–12)] cm. longa, basim versus 4–12 mm. lata (foliis infimis prope caudicem saepe linearibus et 2–3 mm. tantum latis), apicem acutum versus sensim attenuato-angustata, basi non vel paulum rotundata, margine ciliata, aliter costa subtus pubescente excepta glabra [vel ubique satis dense pubescentia]; vaginae saepe purpura tinctae, 5–15 mm. longae, linea pubescente excepta subglabrae [vel ubique dense pubescentes], ore pilis albidis 1–3[-4] mm. longis margine conspicue ciliatae. *Spathae* singulatim ex axillis plerumque distalibus ortae, plerumque conspicue pedunculatae, paucae ultimae nonnunquam subsessiles, pedunculis 1·5–4·5 cm. longis pilis patentibus vel paulum deflexis unilateraliter pubescentibus, semicordiformes, 1·5–2·3 [–2·5] cm. longae, 0·9–1·1[–1·2] cm. latae, a latere visae subtus paulum concavae hinc leviter falcatae, raro rectae, [nonnunquam etiam deflexae], apice acutae, vix acuminatae, marginibus satis dense et conspicue ciliatis ad basim liberis, aliter pilis circiter 1 mm. longis plus minusve [nonnunquam dense] pubescentes. *Flores* magni, e spatha exserti. *Sepala* ovato-elliptica, 5 mm. longa. *Petala* superiora brunneo-lutea, [rarius purpureo-caerulea] basi in unguem tenuem 4·5–6 mm. longum abrupte angustata, lamina circiter 1 cm. longa 1–3 cm. lata; petalum inferius quam sepala vix longius. *Stamina fertilia antica* 3, filamentis [7–] 9 mm. longis, antheris 2–2·5 mm. longis. *Staminodia postica* 3, filamentis [5–]6–7 mm. longis. *Ovula* 5. *Stylus* [9–]12–13 mm. longus. [*Capsula* circiter 5 mm. longa, 2·5–3 mm. lata, apice apiculata, loculo dorsali seminifero dehiscente, loculis ventralibus 2-seminiferis; capsula 3–4-sperma (? an semper). *Semina* griseo-brunnea, forma variabilia, plus minusve reniformia, vel obscure trilobata, vel uno extremo truncata, 1·75–2·5 mm. longa, 1·25–1·5 mm. lata, irregulariter foveolata necnon scamnis haud rectis saepe anastomosantibus percursa.]

Ethiopia. Mega, 4° 5′N., 38° 20′E., closely grazed ride in *Juniperetum*, 1950 m., 20 Nov. 1952, *Gillett* 14382 (K, holotypus):—corolla large, dark brownish-yellow.

Uganda. Karamoja District: Mt. Debasien, in short turf over rock, 2380 m., May 1948, *Eggeling* 5817:—flowers buff-brown, decorative. Ankole District: E. Ankole, near Sanga Rest Camp, 1340 m., Oct. 1932, *Eggeling* 592 *in F.H.* 967:—succulent, creeping herb, with dark purplish-blue flowers. Ruizi R., open woodlands, rocky hillsides, termite mounds, 1310 m., 19 Apr. 1951, *Jarrett* 501:—semi-erect or creeping herb; flowers buff. Masaka District: Buddu, 1250 m., Dec. 1904, *Brown* 129. Mubende District: Kakumiro, short grass community, 16 Oct. 1933, *H. B. Johnston* 640:—runner on ground; flowers blue.

Kenya. Uasin Gishu District: Turbo, at roadside in short grass and waste dry land, *Miss Napier* 514:—flowers apricot, much larger than the other sorts. Laikipia District: Rumuruti, short grass and rock-outcrops, 1980 m., 27 May 1932, *R. Harger* 33:—throws roots at each downcurving joint; flowers bronze-yellow. Nakuru District: between town and L. Nakuru, 10 May 1949, *Maas Geesteranus* 4604 (L):—flowers violet-blue. Naivasha District: Longonot, lava crevices, 2130 m., Mar. 1922, *Dummer* 5166. Naivasha, in grassland near lake, 1830 m., Apr. 1932, *Miss Napier* 1842:—upper petals buff; rooting at nodes. Kedong, Mount Margaret Estate, in grassland round hill, very common, 1920 m., *Bally* 1054. Naivasha, Sterndale, 13 May 1943, *Andrews* 494 *in Bally* 4470:—prostrate herb. North Nyeri District: Daiga near Nanyuki, 1830 m., Oct. 1941, *Boy Opiko in Bally* 1776. Nairobi District: Nairobi, *Whyte s.n.* Nairobi District, 1680 m., 1924, *MacDonald* 760. Nairobi, French Mission Land, swampy ground, damp grassland, 1800 m., 3 June 1930, *Miss Napier* 178:—flowers with two large buff-coloured petals. Nairobi, 1950, *Mrs. Hale* 51:—flowers brown-orange and 'crushed strawberry'. Machakos, Oct. 1896, *S. L. Hinde s.n.* (BM). Magadi Junction, 1926, *Mrs. Prescott Decie s.n.* (BM). ? North Kavirondo District: SW. slopes of Mt. Elgon, moist places, 1934, *Mrs. Tweedie* 179. ? Masai District: Mbagathi, Bahati Estate, in pockets of good soil in bottom of rocky, generally dry valley, 1740 m., 28 Dec. 1932, *C. G. Rogers* 221 (BM, K):—perennial, appearing after heavy rain; flowers maroon-coloured. Exact locality uncertain, *C. F. Elliott* 169, *Miss Napier* 1345:—flowers buff to almost brown. Kikui, 11 June 1902, *Kassner* 994 (BM).

Tanganyika. Shinyanga District: Shinyanga, seasonal swamp, marshy grassland, Feb.–Apr. 1932–3, *Romola D. Bax* O:—15–23 cm. high; upper petals orange. Musoma District: Musoma, Seronera, 1 Jan. 1937, *Mrs. Moore* 14:—fairly common grass creeper with pale brown flowers. Moshi District: Moshi, Sanya R., c. 1070 m., Mar. 1928, *Haarer* 1223:—flower dull crimson to salmon.

C. reptans has been frequently misidentified in the past with *C. purpurea* C. B. Cl., a normally more or less erect plant whose stems seem never to loop along the ground with arcuate internodes and geniculate nodes as they do in *C. reptans*. Moreover the leaves of *C. purpurea* are linear, the spathes are much smaller, and they are all sessile or almost so.

In *C. reptans* some suberect shoots may accompany the trailing ones, and even the latter can clearly be seen to trail only when they have grown in length, but even the young trailing stems show some bending of the internodes and nodes.

Commelina zambesica *C. B. Cl.* in DC., Monogr. Phan. 3: 161 (1881); C. B. Cl. in Thiselton-Dyer, Fl. Trop. Afr. 8: 43 (1901).

The presence in West Africa of this well-known species of eastern and southern tropical Africa seems worth mention. So far it has been collected in Nigeria and the British Cameroons.

Nigeria. Niger Province, Gwari District: Cheche Forest Reserve (probably), Apr.–June 1958, *E. W. Jones* 115, 152, *s.n.* Zaria Province, Jemaa District: Sanga River Forest Reserve, Kurmin Kwagiri, transition woodland at margin of forest outlier, 6 Oct. 1957, *Keay in F.H.I.* 37119 (FHI):—weakly erect herb to 70 cm. high; flowers with 3 bright blue petals, collected in flower about 10.30 a.m. Without exact locality, July 1930, *Lely* P551 (FHI, K):—annual 120 cm. high with large bright blue flowers, in plains near water. Cultivated at Ibadan from material collected by Keay (*in F.H.I.* 37119) in N. Nigeria, 16 Aug. 1959, *Stanfield* 183:—widely straggling, with upright stems to 60–90 cm. high; leaves elliptic; flowers deep blue; spathes broad and deep, closed, enclosing two peduncles, the ventral one usually with male flowers only; capsules with two developed cells (each containing two seeds, the third cell partially aborted and usually containing one large seed); seeds black, with raised reticulations.

British Cameroons. Dikwa Division: hills above Gwoza, high valley in the hills near a stream, 1070 m., 16 Jan. 1955, *Miss A. McClintock* 154:—habit straggling; stems and leaves bright green; flowers very bright blue; petals round at tip, long and narrow at base.

Commelina (Subgen. *Didymoön*, Sect. *Dissecocarpus*) **grandis** *Brenan*, sp. nov.; ob spathas maximas glabras marginibus alte connatis et capsulae formam ut videtur *C. grossae* C. B. Cl. affinis, caulibus semper elongatis quam folia caulina inferiora longioribus, foliis anguste lanceolatis usque lineari-lanceolatis basi subcordatis et caulem amplectentibus margine dense ciliatis, floribus albis nec caeruleis differt.

Herba robusta, erecta, usque ad 43 cm. alta, radicibus nondum visis. *Caules* glabri [vel nonnunquam tantum linea pubescente infra vaginae basim notati]. *Folia* crassiuscula, anguste lanceolata usque lineari-lanceolata [vel suprema ovata]; inferiora 12–18[–20] cm. longa, 1·2–1·6[–4·5] cm. lata, superiora longitudine sensim decrescentia; omnia apice acuta, inferne haud angustata, basi ipsa subcordata et caulem amplectentia, utrinque glabra, margine dense et molliter ciliata; vaginae infimae 4 [–5] cm. longae, nonnunquam sine laminis, glabrae [vel saepius extra dense griseo-velutinae], superiores longitudine decrescentes, linea pubescente excepta semper glabrae. *Spathae* singulatim ex axillis 1–4 supremis ortae, pedunculatae, pedunculis glabris vel inconspicue sparsissime puberulis [3–]4·5 8 cm. longis, maximae, 3·6–4[–5] cm. longae, 2·1–2·5[–3·2] cm. latae, apice breviter acuminatae, etiam marginibus glabrae, marginibus ipsis per 1·5–1·8 cm. alte connatis. *Flores* albi, marcidi tantum visi, circiter 7–10 mm. pedicellati, vel pedicello infimo longiore. *Capsula* plus minusve quadrata, circiter 6·5 mm. longa et lata, bivalvata, loculo dorsali absente, vel raro trivalvata. *Semina* pro loculo 2 vel uno abortivo, griseo-nigra, subglobosa, circiter 2·25 mm. diametro, apiculo unilaterali praedita, testa plus minusve pulverulenta.

Northern Rhodesia. Abercorn District: Mpulungu road, opposite turning to Chilongowelo, in very thick bush, loamy soil, 1465 m., 16 Feb. 1952, *Mrs. Richards* 899:—leaves and stems thick and fleshy; leaves edged with white hairs, lower part clasping stem; spathe very large, fleshy; flowers white; stamens yellow. Abercorn–Kambole road, in bush among grass, 1520 m., 1 Jan. 1955, *Mrs. Richards* 3826:—leaves glabrous except at edges; spathe-peduncles glabrous; flowers white. Abercorn, road to St. Paul's Mission, side of road in thick grass and vegetation, 1520 m., 9 Mar. 1955, *Mrs. Richards* 4852:—sheaths hairy; leaves glabrous except for tiny hairs at the edges. Inono Valley, woodland above Pineapple Farm, in shade on loam soil, 910 m., 13 Apr. 1955, *Mrs. Richards* 5432:—45 cm. high; leaves with a few hairs; flowers cream. Kambole–Abercorn road, in woodland and open grassland, 1500 m., 18 Feb. 1957, *Mrs. Richards* 8211 (K, holotypus):—stems and spathe glabrous, pale green; flowers white; exudes white fluid. Near Katenga, Kambole Falls, in woodland near Falls, 1500 m., 21 Feb. 1957, *Mrs. Richards* 8301:—sheaths hairy; edge of leaves hairy; spathe large; flowers white.

When *Commelina grossa* C. B. Cl. was first described in Thiselton-Dyer, Fl. Trop. Afr. 8: 60 (1901), it was known only from one excellent and copious collection by Nutt, from Kambole in Northern Rhodesia. No capsules were, however, present and Clarke therefore placed it among the imperfectly known species at the end of the genus. Since then, however, much more material has been added, mostly from the magnificent collections made by Mrs. H. M. Richards in Abercorn District, Northern Rhodesia, where Kambole, the type-locality, is situated, but also from Tanganyika (Tunduru District, just E. of the Songea District boundary, 855 m., 5 June 1956, *Milne-Redhead & Taylor* 10558). Fruits of *C. grossa* are now known, and the 2-valved, 4-seeded capsules with subglobose seeds show that its correct place is in Sect. *Dissecocarpus*, in the neighbourhood of species Nos. 36–44, particularly *C. spectabilis* C. B. Cl. and *C. cecilae* C. B. Cl.

C. grandis seems to be most nearly related to *C. grossa*, with which it shares unusually large glabrous spathes whose margins are connate well above base. The capsules and seeds of *C. grandis* and *C. grossa* are normally similar, but one gathering of the former (*Mrs. Richards* 5432) shows a (presumably abnormal) 3-valved capsule. This sort of variation shows how justified was the warning given by Dr. J. K. Morton (in Journ. Linn. Soc., Bot. 55: 510 (1956)), about the unreliability of C. B. Clarke's subdivisions on capsule characters of the Subgenus *Didymoön* of *Commelina*.

The now rather numerous gatherings of *C. grossa* and *C. grandis* maintain well their distinctive features, with, however, one exception:

Northern Rhodesia. Abercorn District: between Nimkola and Lunzua R., in open bush, on sandy sandstone soil, 910 m., 23 Feb. 1955, *Mrs. Richards* 4641:—45 cm. high; leaves with hairy edges; spathe with a few brown lines, exuding quantities of white liquid; flowers blue.

This perplexing specimen, while very similar to *C. grossa*, shows a mixture of *C. grandis* and *C. grossa* characters:—leaves linear to linear-lanceolate, not at all auricled or amplexicaul at base, flowers blue (*C. grossa* characters); stems exceeding or only slightly shorter than lower leaves, leaves white-ciliate on margins (*C. grandis* characters). Hybridity has been convincingly reported in *Commelina* (see Dr. J. K. Morton in Journ. Linn. Soc., Bot. 55: 510 (1956), and I believe that *Mrs. Richards* 4641 is probably a product of hybridisation between *C. grossa* and some other species, perhaps *C. grandis*. The characters given above as '*C. grandis* characters' are not confined to that species, and may well have been derived from another source, especially as some of the spathes show a very minute inconspicuous puberulence found in neither *C. grandis* nor *C. grossa*.

Commelina guineënsis *Hua* in Bull. Mus. Hist. Nat. Paris 1: 119 (1895).

This species was based on two syntypes, *Paroisse* 135 from Guinea, and *Thollon* 961 from Brazzaville in the Moyen Congo, both of which, thanks to the kindness of Professor A. Aubréville, I have been able to examine. C. B. Clarke (in Fl. Trop. Afr. 8: 55 (1901)) maintained *C. guineënsis* as a distinct species, although, as he admitted, he had not seen authentic material. Hutchinson & Dalziel (Fl. W. Trop. Afr. 2: 320 (1936)) made it a synonym of *C. vogelii* C. B. Cl., and this view was followed by Morton in Journ. Linn. Soc., Bot. 55: 523 (1956), although he replaced *C. vogelii* by *C. gerrardii* C. B. Cl. as the accepted name.

Neither of the two syntypes is in ripe fruit. Nevertheless *Paroisse* 135 is a very good match with *C. livingstonii* C. B. Cl., now well-known in West Africa (see Morton, *l.c.* 526). *Thollon* 961 is not, I consider, conspecific with *Paroisse* 135, but corresponds (as far as can be judged without fruit), with *C. gerrardii* C. B. Cl. as interpreted by Morton (*l.c.*), which however appears to be antedated by *C. bracteosa* Hassk. The chance of error in the identification of *Thollon* 961 is considerable, however, as certain other species such as *C. eckloniana* Kunth look deceptively similar when seeds are not available.

It seems likely that Hua based his concept of the species more on *Thollon* 961 than *Paroisse* 135, as the former is a better specimen with an immature fruit visible. In any event the name *Commelina guineënsis* should fall into disuse.

Aneilema R. Br.

Aneilema gillettii *Brenan*, sp. nov.; ob habitum robustum, inflorescentias satis laxas, bracteas ramulosque verticillatos, flores lilacinos pro genere magnos prope *A. hockii* De Wild. ponenda, sed bracteis bracteolisque majoribus scariosis his ramuli lateralis apicem versus ob internodia brevia semper plus minusve confertis et amplectentibus sed haudquaquam perfoliatis, filamentis staminum lateralium fertilium in parte ima tertia breviter pubescentibus, capsula apice acuminato-acuta nec retusa facillime distinguenda.

Herba perennis, robusta, usque ad 40[–50] cm. alta. *Radices* caespitosae, elongatae, usque ad 9 cm. vel ultra longae, tuberosae, cylindricae. *Caules* inflorescentiis exceptis simplices vel superne ramo laterali singulo praediti, praesertim superne pilis apice uncinulatis brevissime et satis dense pubescentes. *Folia* infima obovato-elliptica, superiora plus minusve ovato-elliptica, usque ad 7–11 cm. longa, 3–6·3 cm. lata, suprema minora, pilis longiusculis crebris cum aliis brevissimis perminimis supra pubescentia, subtus pilis longitudine variabilibus pubescentia, apicem acutum versus angustata, marginibus inferne breviter ciliatis superne minute denticulatis, basi cuneata vel in foliis infimis attenuata sed vix 'petiolata'; vagina laxa, in parte inferiore clausa, circiter 1·5–3 cm. longa et 5–10 mm. diametro, extra satis dense brevissime pubescens vel puberula, in marginibus connatis et ore pilis albidis ciliatis. *Inflorescentiae* terminales, satis laxae, paniculatae, subcylindricae, circiter 15–23 cm. longae, 5–6 cm. latae, solitariae vel nonnunquam altera ex axilla superiore caulis orta; axis more caulis brevissime pubescens, ramulos laterales 2–2·8[–3·5] cm. longos more axis vestitos verticillatim (3–5[–6] pro nodo) ferens; bracteae basi cujusque ramuli singulatim axi insertae hinc etiam verticillatae, lanceolatae vel infimae tantum ellipticae, scariosae, 8–12 mm. longae, 3–7 mm. latae, apice subacutae vel obtusae, extra inconspicue puberulae; bracteolae in parte apicali ramuli circiter 5, confertae, late ovatae usque suborbiculares, 2–3·5 mm. longae, 2–4 mm. latae, scariosae, apice rotundatae, extra inconspicue puberulae, sessiles et ramulum amplectentes sed haud perfoliatae. *Flores* secundi; pedicelli glabri, 0·5–1 cm. longi, post anthesin usque ad 1·7 cm. producti, basi articulati. *Sepala* 3, aequalia, [viridia], sub lente extra minute et inconspicue puberula, ovata, 6·5–7 mm. longa, 3·5–4 mm. lata, apice cucullato-obtusa. *Petala* 3; duo postica late obovato-elliptica, 12 mm. longa, 9 mm. lata, basi in unguiculum circiter 2–3 mm. longum angustata; unum anticum ellipticum, 12 mm. longum, 7 mm. latum, basi angustatum sed vix unguiculatum. *Stamina fertilia antica*: duo lateralia filamentis [rubro-viridibus vel brunneis] circiter 1·7–2·4 cm. longis, sinuosis, in parte ima tertia breviter et unilateraliter pubescentibus aliter glabris, antheris ellipsoideis 3 mm. longis 1·5–2 mm. latis; unum centrale filamento [rubro-lilacino] glabro 1·3 mm. longo, anthera 3 mm. longa 2 mm. lata curvata. *Staminodia postica*: duo lateralia filamentis [rubro-lilacinis] glabris 5 mm. longis, apice bifidis ramis circiter 0·25 mm. longis, utroque ramo in corpusculum luteum oblique obovoideum circiter 0·75 mm. longum 0·5 mm. latum desinente; unum centrale filamento 4 mm. longo, corpusculis paullo majoribus et magis curvatis, aliter ut in lateralibus. *Ovarium* glabrum, oblongum, apice angustatum, 3·5 mm. longum, 1 mm. latum, stylo glabro circiter 1·7 cm. longo. [*Capsula* bivalvata, glabra, oblongo-ellipsoidea, 10–

11 mm. longa, 5 mm. lata, pallide straminea, apice acuminato-acuta primo violacea, cellulis epidermidis anguste transverse linearibus. *Semina* 8–12 pro capsula, plus minusve irregulariter quadrata usque subreniformia, 2–2·5 mm. longa et lata, pallide brunnea, testa inconspicue scrobiculata].

KENYA. Northern Frontier Province: Moyale, montane scrub in shade, 1100 m., 14 Oct. 1952, *Gillett* 14033 (K, holotypus):—corolla purple, large; roots long, cylindrical, tuberous, boiled and eaten by the Boran; occasional–frequent: vernacular name (Boran) 'mareja' or alternatively and better 'kamechi', but this name not specific. Same locality and altitude, degraded montane scrub, 4 Nov. 1952, *Gillett* 14132:—flowers open a.m., shrivelled at midday, visited by a small black bee and by a black and orange beetle which sat on the filament and worked outwards to the fertile anthers; 3 equal petals; stamens: one upper [staminode] with short straight purple filament and larger divaricate yellow anthers; two upper [staminodes] slightly larger with straight purple filaments and smaller divaricate yellow anthers; one bottom with medium curved purple filament and large normal purple-black anther; two lower with long curved brown filament and normal purple-black anthers. The flowers appear to be protandrous, the style lengthening greatly and protruding from the calyx on the second day after petals and stamens have collapsed.

This extremely distinct new species is most closely related to *A. hockii* De Wild., but differs in the larger scarious bracts on the main axis of the inflorescence, in the scarious, amplexicaul but not perfoliate bracteoles aggregated near the ends of the lateral branches of the inflorescence, in the filaments of the two lateral lower fertile stamens having a zone of short unilateral pubescence in their lower third, and in the capsule being acutely acuminate at apex. *A. hockii* has the bracts and bracteoles much thicker and more opaque, apparently more or less green, the former at most about 6 mm. long and usually considerably shorter, the latter normally much more spaced out along the lateral inflorescence-branches and decidedly amplexicaul with their margin continuous so that each bracteole forms a small somewhat lopsided cup. The filaments of the fertile stamens of *A. hockii* are all glabrous, and the capsule is angled and retuse at apex.

I have examined the holotype of *A. obbiadense* Chiov. (Somalia, *Puccioni & Stefanini* 592 (646), FI), which from the description might be considered to have some affinity. *A. obbiadense*, which seems not to have been re-collected, is certainly not conspecific with *A. gillettii*, having the bracts on the main axis of the inflorescence only up to 3 mm. long, the lateral branches of the inflorescence not or only the lowest verticillate, the bracteoles much more spaced out, and glabrous sepals about 4·5 mm. long. In addition, apparently, the roots of *A. obbiadense* are, although elongate, not or scarcely tuberous-thickened.

I have observed on living plants of *Gillett* 14132 cultivated at Kew that the distal flowers of the lateral branches of the inflorescence (each of which represents a cincinnus) were functionally ♂, with abortive ovaries and short styles.

Aneilema nyasense *C. B. Cl.*

var. **nyasense**

A. nyasense C. B. Cl. in Thiselton-Dyer, Fl. Trop. Afr. 8: 66 (1901).
A. vankerckhoveni De Wild. in Bull. Jard. Bot. Brux. 5: 85, 160 (1915); De Wildeman, Pl. Bequaert. 5: 222 (1931); Troupin, Fl. Spermat. Parc Nat. Garamba 1: 159 (1956).

Sepala circiter 6 mm. longa, 2–3 mm. lata, fructu longiora.

Congo Republic. Kasai: Saint-Trudon, 5 Apr. 1913. *Vankerckhoven s.n.* (BR, holotypus *A. vankerckhoveni*, K, photo.). District Forestier Central: Barumbu, 30 Oct. 1913, *Bequaert* 1028. Panga, 17 Dec. 1913, *Bequaert* 1525 (BR, not seen). Lileko, between Yangambi and Basoko, 28 Sept. 1938, *Louis* 11370. Bank of the Lubilu, 23 Sept. 1939, *Louis* 16109. Ubangi-Uele: Parc National de la Garamba, Garamba valley, central track near km. 30, 700–800 m., 10 Apr. 1952, *Troupin* 713.

Uganda. Masaka District: Sese Islands, Sozi, 1130 m., edge of bush near forest, Dec. 1922, *Maitland* 335. Sese Islands, Bukasa, 1 July 1925, *Maitland* 1198. Sese Islands, Bugala, 1190 m., edge of secondary bush, 5 June 1932, *A. S. Thomas* 112. Lake Nabugabo, marshy ground near lake-shore, among clumps of other vegetation including trees and shrubs, 1140–1160 m., Aug. 1935, *Chandler* 1386. Same locality, damp ground, 1130 m., *Lind* 173. Mango District: Entebbe, 1190 m., *Mahon s.n.* & 1904, 1190 m., *Brown* 22. Buvuma, near Kitamiro, 1130 m., *Dawkins* 414 (BM, K). Kampala, Namanve Plantation, in *Eucalyptus* plantation originally *Papyrus* swamp, trees recently felled, 1220 m., *Lind* 155.

Tanganyika: Bukoba District: Kiao Island, in forest glade, Sept.–Oct. 1935, *Gillman* 392. Rungwe District: Lusangu, in damp mud of rice-field, 900 m., 21 May 1957, *Mrs. Richards* 9850. Njombe District: upper Ruhudje R., Lupembe region, 1931, *Schlieben* 1266.

Nyasaland. Northern Province: Kondowe to Karonga, July 1896, *Whyte* 337 (K, holotypus *A. nyasensis*).

The more abundant material now available of *A. nyasense* and *A. vankerckhoveni* proves that the two are strictly synonymous. *A. nyasense* is the earlier of the two names, and has hitherto been considered to be endemic to Nyasaland. However the species in its new sense is shown to have a very wide range geographically.

A. nyasense is clearly closely related to *A. aequinoctiale* (P. Beauv.) Kunth. The two species have a similar straggling habit, lax inflorescences, yellow flowers, and capsules conspicuously angled at top, with the cells of the external layer of the wall appearing almost round when viewed under a lens.

A. nyasense differs from *A. aequinoctiale* in being less robust, in the leaves being all rounded or even subcordate at base, in the presence of rusty hairs on the leaf-sheaths at least on the margins (this character is easily observed and very significant), in the smaller flowers, and smaller, fewer-seeded capsules.

Throughout most of its range *A. nyasense* is rather constant apart from insignificant fluctuations in the number of rusty hairs on the leaf-sheaths. However, in the coastal area of Tanganyika the following marked variant occurs.

var. **brevisepala** *Brenan*, var. nov.

Sepala 3–4 mm. longa, 2–2·5 mm. lata, fructu paullo breviora vel subaequilonga.

Tanganyika. Pangani District: Msubugwe Forest, in thick forest on sand, 150 m., 21 Sept. 1955, *Tanner* 2223. Same locality and altitude, on edge of semi-permanent water on sandy marl, 3 Mar. 1956, *Tanner* 2632. Same locality, by water-hole in dry evergreen forest, 17 Oct. 1955, *Milne-Redhead & Taylor* 7312 (K, holotypus varietatis):—perennial, with prostrate stems up to 3 m. long, forming large masses; leaves bright green, with deeply sunk midrib; two large petals yellow, third pale greenish-yellow; filaments mauve; two anthers greenish-blue; staminodes sulphur-yellow. Morogoro District: Uluguru Mts., NE. side, 580 m., 23 May 1933, *Schlieben* 3973 (BM):—flower yellow. Lindi District: Tanda-ngongoro, 13 May 1903, *Busse* 2483 (BM). Lake Lutamba, in clumps among grass under trees, 230 m., 5 Apr. 1935, *Schlieben* 6233 (BM).

The above gatherings, from eastern Tanganyika, are readily separable from the rest of the species by their shorter sepals which do not exceed the capsule. Fortunately specimens both of var. *nyasense* and var. *brevisepala* have been collected in spirit (*Dawkins* 414, *Milne-Redhead & Taylor* 7312). Examination of the flowers so preserved shows that, except for the sepals, there are

no other significant differences in size or structure. For the present these short-sepalled plants seem best as a variety of *A. nyasense*.

Aneilema tacazzeanum *Hochst. ex A. Rich.*, Tent. Fl. Abyss. 2: 343 (1850–1); [('Hassk.')] Hochst. ex C. B. Cl. in DC., Monogr. Phan. 3: 222 (1881); C. B. Cl. in Fl. Trop. Afr. 8: 66 (1901).

Lamprodithyros tacazzeanus (Hochst. ex A. Rich.) Hassk. in Peters, Reise Mossamb., Bot.: 531 (1863), excl. descript.

Ancilema aequinoctiale (P. Beauv.) Kunth var. *minor* C. B. Cl. in DC., Monogr. Phan., 3: 221 (1881).

When A. Richard described *Aneilema tacazzeanum* ('tacazzeana') in Tent. Fl. Abyss. 2: 343 (1850–1) he cited two gatherings from Ethiopia, *Schimper* 1660 from the Tacazze R., and an unnumbered specimen of Quartin-Dillon and Petit. C. B. Clarke wrote in Fl. Trop. Afr. 8: 66 (1901): 'Schimper, 1660, contains, by admixture, both *A. aequinoctiale* and *A. tacazzeanum*. A. Richard describes therefrom his *A. tacazzeanum* as having six seeds to each cell of the capsule, so that his plant was certainly *A. aequinoctiale*, Kunth.' Clarke then proceeds by noting that Hasskarl described his *Lamprodithyros tacazzeanus* as having only 2–1 ovules per cell, and deduces that Hasskarl described the true *A. tacazzeanum* as intended by Hochstetter, but that *A. tacazzeanum* Hochst. ex A. Rich. is a synonym of *A. aequinoctiale* (P. Beauv.) Kunth. Hasskarl does indeed give a long and detailed description. I have not seen the specimen on which it was based, which is now destroyed, but his mention of foxy-red hairs on the margin of the leaf-sheath, and of short whitish pubescence on the sepals, suggests that it was not *A. tacazzeanum*, which is not known from Portuguese East Africa, but more probably *A. nyasense* C. B. Cl. or a related species.

Through the courtesy of the Director of the Muséum National d'Histoire Naturelle at Paris, I have been enabled to examine the two specimens mentioned above that were cited by A. Richard under his *A. tacazzeanum*. Both bear C. B. Clarke's labels identifying them with *A. aequinoctiale*. One of the two, *Schimper* 1660, is in flower only; however, its short sepals and lack of hooked stiff hairs on the stems conclusively eliminate it from *A. aequinoctiale*. The Quartin-Dillon and Petit specimen is in fruit; the glossy stipitate capsules emarginate at apex and with elongate not isodiametric epidermal cells are again quite different from those of *A. aequinoctiale*. One of the capsules shows three seeds sitting in one of the cells. Both specimens are certainly *A. tacazzeanum* as interpreted by Clarke in Fl. Trop. Afr. 8: 66 (1901). To sum up: *Aneilema tacazzeanum* Hochst. ex A. Rich. was based on unmixed material; the records of *A. aequinoctiale* from Ethiopia are false, in fact the species is at present unknown from that territory; and *A. tacazzeanum* Hochst. ex C. B. Cl. (excluding the reference to Hasskarl's description of *Lamprodithyros taccazzeanus*) becomes synonymous with *A. tacazzeanum* Hochst. ex A. Rich. The description by A. Richard of the capsule-cells of *A. tacazzeanum* as each six-seeded must be due to a mistake.

Aneilema dregeanum Kunth and A. schlechteri K. Schum.

These two species of south-eastern Africa have not hitherto been clearly separated from each other. Together they form a natural group, character-

ised by ovate to lanceolate leaves, medium-sized blue flowers in rather lax panicles, filaments of lateral fertile stamens pubescent near apex, and two-valved capsules rounded not angled at apex.

There is a strong resemblance in habit and general appearance to several other species of eastern Africa, notably *A. benadirense* Chiov., *A. obbiadense* Chiov., *A. petersii* (Hassk.) C. B. Cl., *A. rendlei* C. B. Cl., *A. somaliense* C. B. Cl., and *A. umbrosum* (Vahl) Kunth. All these, however, have glabrous stamen-filaments besides other distinguishing features.

Aneilema dregeanum *Kunth*, Enum. 4: 73 (1843); C. B. Cl. in DC., Monogr. Phan. 3: 229 (1881) & in Thiselton-Dyer, Fl. Cap. 7: 13 (1897).

Ab *A. schlechteri* K. Schum., cui persimilis, foliis lanceolatis, in media et superiore parte caulis haud vel vix 'petiolatis', capsulis oblongis 6–7 mm. longis quam sepala duplo usque triplo longioribus, loculis 2–3-spermis, cellulis epidermidis capsuli transverse linearibus.

Portuguese East Africa. Zambezia: Lugela District, Moebede road, in shady forest, 12 Jan. 1948, *Mrs. H. G. Faulkner, Kew No.* 194:—rather spreading straggling plants with branches 0·6–1 m. long and pale blue flowers; does not appear to be common. Same locality, 4 Apr. 1948, *Mrs. H. G. Faulkner, Kew No.* 194 (2nd gathering). Same locality, 23 Mar. 1949, *Mrs. H. G. Faulkner, Kew No.* 194 (2).

South Africa. Zululand: June 1882, *Mrs. McKenzie s.n.*:—in damp places. Natal: without more precise locality, *Gerrard* 1837, *Mrs. Saunders s.n.* Near the Umkoruangi R., c. 900 m., 10 Feb. 1895, *Schlechter* 6711. Port Shepstone District, near Mehlomnyana, in tropical forest, c. 360 m., 21 Feb. 1947, *Acocks* 13312:—flowers blue. Pondoland: between Umtata and St. Johns Rivers, 300–600 m., *Drège* 4471 (BM, K, isotypi).

The basis for the inclusion of *A. dregeanum* by C. B. Clarke in Thiselton-Dyer, Fl. Trop. Afr. 8: 70 (1901), a specimen collected by Kirk at Tete in Portuguese East Africa in Feb. 1859, shows more compact inflorescences than in *A. dregeanum*, ovate leaves with unusually long 'petioles', and linear upper bracts. It is clearly not *A. dregeanum* but probably *A. pedunculosum* C. B. Cl.

Aneilema schlechteri *K. Schum.* in Engl., Bot. Jahrb. 33: 376 (1903).

A. dregeanum Kunth var. *galpini* C. B. Cl. in Thiselton-Dyer, Fl. Cap. 7: 13 (1897).

Ab *A. dregeano* foliis ovatis, in media et superiore parte caulis in 'petiolum' 0·5–1·5 cm. longum distinctum angustatis, capsulis suborbicularibus vel obovato-suborbicularibus 4–5 mm. longis et fere aequilatis, loculis monospermis, cellulis epidermidis capsuli plerumque longitudinaliter linearibus interdum irregularibus vel fere isodiametricis.

Portuguese East Africa. Lourenço Marques: Namaacha, Swaziland frontier, 29° 59′S., 32° 1′ E., clay soil in valleys, 600 m., Feb. 1931, *Gomes e Sousa* 420. Goba, near the Fonte dos Libombos, in dense ravine forest, 12 Mar. 1958, *Grandvaux Barbosa* 8261:—flowers lilac. Goba, forest edge, 23 Feb. 1955, *Exell, Mendonça & Wild* 556 (BM):—flowers blue.

South Africa. Transvaal: Komati Poort, 15 Dec. 1897, *Schlechter* 11748 (K, isotypus *A. schlechteri*). Barberton, valley near Edwin Bray Battery, on hillside among rocks in damp, shady places, 610 m., Dec. 1890, *Galpin* 1187 (K, holotypus *A. dregeani* var. *galpini*). Barberton, *Thorncroft* 11310. Swaziland: Piggs Peak District, Komati Bridge, c. 760 m., 15 Apr. 1957, *Compton* 26824. Natal: Inanda, Feb., *Wood* 1220.

Although *A. schlechteri* and *A. dregeanum* are clearly extremely close relatives, the very important distinguishing characters in the capsule, which are correlated with less obvious leaf-differences, make it preferable for them to be maintained as distinct species. The isotype at Kew of *A. schlechteri*

shows young plants which have probably not attained their full stature; their capsules are not fully developed and their epidermal cells more irregularly arranged and more nearly isodiametric than usual. I can see no evidence, however, for separating it taxonomically from the rest of the material cited above.

Aneilema pomeridianum *Stanfield & Brenan*, sp. nov.

[*Aneilema lanceolatum* (non Benth.)—Hutch. & Dalz., Fl. W. Trop. Afr. 2: 314 (1936), pro parte, quoad *Anderson* 17, *Chipp* 634, *Johnson* 700, *Dalziel* 267, 449, 806, 807, *Barter* 1117, *Rowland* s.n.; Brenan in Kew Bull. 7: 202 (1952), pro parte].

A. lanceolatum var. *evolutius* ['*evolutior*'] C. B. Cl. in DC., Monogr. Phan. 3: 227 (1881), pro parte, quoad *Barter* 1117, lectotypus, excl. *Vogel* 101, *Barter* 1018; Brenan in Kew Bull. 7: 203 (1952), pro parte.

Manifeste *A. lanceolato* Benth. peraffinis, foliis basalibus longissimis inferne angustatis haud reductis, foliis superioribus magnitudine decrescentibus haud plerumque subaequalibus, marginibus foliorum pilis conicis plus minusve patentibus praeditis haud arcte cartilagineo-serrulatis, floribus post meridiem apertis haud matutinis differt.

Herba [perennis], erecta, usque ad 45(-60) cm. alta. [*Radices* e caudice ortae, elongato-incrassatae.] *Caules* praeter inflorescentias simplices, pilis patentibus usque ad 1 mm. longis dense pilosi [vel nonnunquam pilis omnibus brevibus pubescentes]. *Folia* quam internodia longiora; basalia lineari-lanceolata, plerumque [6–] 15–25 [–30] cm. longa, [0·7] 1 [–1·8] cm. lata, utrinque scabrido-pubescentia, [vel puberula], apice attenuato-acutissima, inferne sensim angustata et hinc spurie 'petiolata'; superiora longitudine sensim decrescentia sed nonnunquam paullo latiora, [usque ad 2·1 cm.]; suprema saepe valde reducta; omnia marginibus pilis conicis plus minusve patentibus praeditis, haud arcte cartilagineo-serrulatis; vaginae clausae, supremae brevissimae, inferiores sensim longiores, usque ad circiter 4·5 cm. longae et 0·5–1 cm. latae, extra puberulae usque pilosae, ore pilis longioribus plus minusve ciliatae. *Inflorescentiae* terminales, solitariae [vel raro 1–3 aliae ex axillis superioribus ortae], conferte paniculatae, [2–] 5–10 cm. longae, 1·5–5 cm. latae; subcylindricae vel plus minusve conicae; axis more caulis vestitus sed pilis longioribus saepe absentibus; rami laterales 0·4–2·5 cm. longi, singulatim vel inferne nonnunquam subverticillatim orti, puberuli; bracteae basi ramorum insertae, late ovato-triangulares, brunneo-scariosae, 2–3 mm. longae, [0·75–] 1·5–2 mm. latae, apice subacutae vel obtusae, extra subglabrae vel praesertim medio inconspicue puberulae; bracteolae perfoliatae, oblique cupuliformes, primo opacae mox brunneo-scariosae, 1·5–2 mm. longae, prope apicem dorso incrassatae et ibi forsan glandulosae. *Flores* caerulei; pedicelli apicem curvatum versus puberuli, inferne glabri, floriferi 4–6 mm. longi, fructiferi usque ad 7·5 mm. longi, basi articulati. *Sepala* 3, subaequalia, extra glabra vel basim versus sparse puberula, late elliptica, 3–3·5 mm. longa, 2·25–2·5 mm. lata, apice rotundata, uno antico quam alia paullo latiore et apice magis cucullato. *Petala* 3; duo postica circiter 6[–8] mm. longa, 4[–5] mm. lata, basi 1·5[–3] mm. longe unguiculata, lamina suborbiculari; unum anticum lanceolato-ellipticum, 4 mm. longum, 1·5 mm. latum, basi angustatum sed haud

unguiculatum, apice angustato-rostratum. *Stamina fertilia antica*: duo lateralia filamentis circiter 6 mm. longis supra medium zona puberula praeditis, antheris ellipsoideis 1·25 mm. longis, 0·8 mm. latis; unum centrale filamento glabro circiter 4 mm. longo, anthera suborbiculari circiter 0·75 mm. diametro thecis arcuatis extremis conniventibus. *Staminodia postica* lutea: duo lateralia filamentis glabris 3 mm. longis apice bifidis, utroque ramo in corpusculum transverse oblongo-ellipsoideum 0·75 mm. longum 0·3 mm. latum desinente; unum centrale filamento 0·7–1·5 mm. longo [apice bicorpusculari]. *Ovarium* puberulum, stylo glabro circiter 6–7 mm. longo. *Capsula* bivalvata, nitida, subglabra, oblongo-ellipsoidea, 6–7 mm. longa, [3·5 ·] 4·5 mm. lata, apice rotundato-emarginata, basi rotundata sed haud stipitata, cellulis epidermidis transverse elongatis. *Semina* 2 pro loculo, reniformia vel irregulariter quadrata, 2·5 [–2·75] mm. longa, [1·5–] 2 mm. lata, brunnea, testa manifeste foveolata.

Ghana. Afram Plains, 17 Mar. 1900, *W. H. Johnson* 700:—with pale blue flowers. Volta River, *J. Anderson* 17. Kwahu, W. of Abene, rocky savannah, 6 Jan. 1914, *Chipp* 634:—herb to 20 cm. high. Yendi, Apr. 1928, *Lloyd Williams* 163:—herb 30 cm. high, with violet flowers, common; used for healing sores in feet: vernacular name (Dagomba) 'nuhmymorea'. Sutawa, 5 May 1930, *A. S. Thomas* D158:—flowers mauve.

Nigeria. Nupe, grassy plains, *Barter* 1117 (K, holotypus *A. pomeridiani*):—60 cm. ; flowers deep blue. Nupe, 1906–7, *Yates s.n.* (BM). Oyo Province, Eruwa, 1893, *Rowland s.n.* Zungeru, wayside and damp waste places, 10 July 1905, *Dalziel* 267. Lokoja, common in waste ground and in gardens, 7 Oct. 1907, *Parsons* 42:—plant 30—45 cm. high, with several fleshy tuberous roots; sepals 3; petals 3, lilac; anthers 6. Sokoto, June 1910, *Dalziel* 449. Abinsi, 3 July 1912, *Dalziel* 806, 19 Mar. 1912, *Dalziel* 807. Katsina Province, Bindawa, 490 m., in cultivated fields, 8 July 1952, *Grove* 20:—vernacular name 'gada machiji'.

A. pomeridianum has been hitherto confused with the closely similar *A. lanceolatum* Benth. (e.g. by C. B. Clarke, Hutchinson & Dalziel, and Brenan, *ll.cc.*, *supra*). Its recognition as a distinct species is largely due to the very careful observations and comparisons carried out by Mr. D. P. Stanfield on the living plant in Nigeria.

The most obvious distinctions of *A. pomeridianum* lie in the foliage, mode of growth and time of flowering. In *A. lanceolatum* the cauline leaves are mostly more or less uniform in length except that towards the base of the stem the lamina becomes shorter and more reduced until at the base itself there are merely sheaths; there is thus no basal foliage in *A. lanceolatum*. In *A. pomeridianum*, on the other hand, the leaves increase markedly in length towards the base of the stem, the basal leaves being up to as much as 30 cm. long. It should be noted that sheaths with reduced or absent laminae may surround the well-developed basal leaves. There is in addition an important distinction in the leaf-margins which in *A. lanceolatum* are closely and minutely serrulate, while in *A. pomeridianum* these are bordered with ± spreading conical hairs more laxly arranged. *A. lanceolatum*, though erect at first, becomes ultimately branched and sprawling, while *A. pomeridianum* remains erect or suberect and almost unbranched except for the inflorescences. Finally, *A. lanceolatum* flowers in the morning, *A. pomeridianum* in the afternoon. This latter character is at present useless in the herbarium, and future collectors of these species are advised to time their activities precisely.

When C. B. Clarke first described *A. lanceolatum* Benth. var. *evolutius* in DC., Monogr. Phan. 3: 227 (1881) he cited under it *Vogel* 101, *Barter* 1018 and 1117. *Vogel* 101 was later separated by Clarke as *A. soudanicum* C. B. Cl. in Thiselton-Dyer, Fl. Trop. Afr. 8: 72 (1901). Thus either *Barter* 1018 or 1117 must be the lectotype of var. *evolutius*. The original description of var.

evolutius agrees well with *Barter* 1117, but in most ways very badly with *Barter* 1018. I therefore choose *Barter* 1117 as the lectotype of var. *evolutius*, and since it is also the holotype of *A. pomeridianum*, the two names become strictly synonymous. This, however, leaves without a name the strongly hairy variant of *A. lanceolatum* which I described in Kew Bull. 7: 203 (1952) under the now untenable var. *evolutius*, and I rename it as follows:—

Aneilema lanceolatum *Benth.* var. **pilosum** *Brenan*, var. nov.

A. lanceolatum Benth. var. *evolutius* C. B. Cl. in DC., Monogr. Phan. 3: 227 (1881), pro parte, quoad *Vogel* 101, *Barter* 1018, sed excl. lectotypum; Brenan in Kew Bull. 7: 203 (1952), pro parte.

Differt ab *A. lanceolato* Benth. typico caulibus plus minusve dense pilosis, pilis caulis semidiametrum vel ultra aequantibus, sepalis extra breviter pubescentibus vel puberulis.

Holotypus: French Cameroons, Fellata Hills, Musgu, May 1854, *Vogel* 101. This specimen is also the holotype of *A. soudanicum* C. B. Cl.

Aneilema richardsae *Brenan*, sp. nov., ob habitum annuum, radices fibrosas, paniculas compactas angustas, flores parvos caeruleos juxta *A. hirtum* A. Rich., *A. spekei* C. B. Cl. et *A. pedunculosum* C. B. Cl. ponenda; forsan *A. hirto* proxima, a quo foliis linearibus usque lineari-lanceolatis, vaginis ore pilis tantum brevibus 0·5 mm. longis, inflorescentiis pilis longis carentibus, bracteis inflorescentiae apice haud dilatato-incrassatis, capsulis angustioribus plane differt. Ab *A. spekei* et *A. pedunculoso* foliis multo angustioribus, pilis oris vaginae, axibus inflorescentiarum atrocaeruleis differt; praeterea ab *A. spekei* capsulis minoribus, ab *A. pedunculoso* foliis non 'petiolatis', bracteis inflorescentiae apice haud dilatato-incrassatis distat.

Herba annua, ut videtur erecta, sparse et praesertim inferne ramosa, usque ad circiter 30 cm. alta. *Radices* e basi ortae, fibrosae. *Caules* pilis uncinatis breviter et inconspicue pubescentes, graciles. *Folia* quam internodia plerumque longiora vel iis aequilonga (saltem inferiora), linearia usque lineari-lanceolata, usque ad 11 cm. longa, 0·3–1 cm. lata, utrinque breviter pubescentia vel puberula et scabridula, apice acuta vel subacuta, basi vix angustata et haudquaquam 'petiolata', marginibus haud denticulatis; vagina saltem in inferiore parte clausa, circiter 0·4–1 cm. longa, ore tantum pilis minimis iis foliorum paginae similibus, pilis longis omnino absentibus. *Inflorescentiae* terminales, 1·5–10 cm. longe pedunculatae, irregulariter sed satis dense paniculatae, [0·7–] 1·5–3 cm. longae, 0·5–2 cm. latae; axis more caulis breviter pubescens, ut ramuli laterales et pedicelli saltem siccitate atrocaeruleo-coloratus; rami laterales 0·3–0·8 cm. longi, singulatim orti, more axis vestiti; bracteae basi ramorum insertae, ovatae vel ovato-triangulares, scariosae, 1–3 mm. longae, 1–2 mm. latae, apice obtusae, haud superne angustatae cum apice dilatato-incrassatae, extra sparse pubescentes; bracteolae bracteis similes sed minores, sessiles et ramulum amplectentes sed haud perfoliatae, dorso prope apicem gibbere glanduloso saepe notatae. *Flores* caerulei; pedicelli nisi apice glabri, 2–3·5 mm. longi, basi articulati. *Sepala* 3, subaequalia, caeruleo-viridia, extra intusque breviter pubescentia, elliptica, 3 mm. longa, circiter 2 mm. lata sed valde concavo-convexa, apice cucullato-obtusa, dorso prope apicem gibbere incrassato et verisimiliter

glanduloso notata. *Petala* 3: duo postica ut videtur obovato-orbicularia, 5 mm. longa et 3–3·5 mm. lata, basi in unguiculum circiter [1·5–] 2 mm. longum angustata; unum anticum anguste obovatum [2·5–] 3·5 mm. longum, 1·5 mm. latum, apice obtusum, basi angustatum sed vix unguiculatum. *Stamina fertilia antica*: duo lateralia filamentis circiter 4 mm. longis prope apicem dense [caeruleo-] barbatis aliter glabris, antheris ambitu oblatis 0·75 mm. longis, 1 mm. latis; unum centrale filamento glabro 1·5 mm. longo, anthera 0·25 mm. longa 0·4 mm. lata. *Staminodia postica* tria filamentis glabris circiter 3–4 mm. longis apice bicorpuscularibus, corpusculis luteis obovoideo-suborbicularibus 0·4–0·5 mm. longis et latis. *Ovarium* pubescens, obovoideum, 1 mm. longum, 0·75 mm. latum, apice abrupte angustatum, stylo glabro circiter 2 [–2·5] mm. longo. *Capsula* bivalvata, breviter glanduloso-pubescens, oblonga, [3–] 3·5–4·5 mm. longa, 2·5–3 mm. lata, straminea, apice plus minusve caerulea et late rotundata fere truncata [nonnunquam leviter emarginata], basi rotundata et non vel vix stipitata, cellulis epidermidis transverse elongatis. *Semina* 2 pro loculo, subreniformia, [1·4–] 1·75–2 mm. longa, [1·3–] 1·5 mm. lata, brunnea, dorso costis circiter 10–12 inconspicue notata.

Northern Rhodesia. Abercorn District: Nkali Dambo near Kawimbe, in very wet bog among longish grass, the only place where the plant is found, 1520 m., 6 May 1952, *Mrs. Richards* 1626:—stem and leaves covered with rather stiff hairs, sticky; calyx greenish-blue, almost metallic-looking, covered with a sticky fluid:—flowers deep blue, very small. Kalambo Farm, Saisi Valley, in very damp open grassy space among thick grass, 1830 m., *Mrs. Richards* 1789 (K, holotypus):—leaves very sticky; stem sticky; flowers pale blue. Nkali Dambo, in very wet peat bog, 1520 m., 16 May 1955, *Mrs. Richards* 5753:—annual 30 cm. high; leaves rough; calyx shiny, with a metallic look; flowers blue. Lower end of Nkali Dambo, in wet peaty marsh, 1680 m., *Mrs. Richards* 9608:—annual; stems and leaves covered with sticky hairs; flowers blue. Lumi River, in wet swamp among grass, 1680 m., 31 May 1957, *Mrs. Richards* 9960A. Lumi River marsh, Kawimbe, growing in mud and water, 1740 m., 27 Mar. 1959, *Mrs. Richards* 12284:—annual; flowers deep blue. Mporokoso District: Mporokoso–Nsama road, in wet swampy ground, 1200 m., 16 Apr. 1957, *Mrs. Richards* 9276:—flowers almost metallic blue.

The slender habit and linear leaves make this an easy species to recognise. Small, hooked hairs cover most parts of the plant and account for the adhesiveness commented on by Mrs. H. M. Richards which is still most evident when the plant is dried.

A. richardsae, although itself distinct enough, finds its closest relationship with a difficult, critical group of species including *Aneilema hirtum* A. Rich., *A. chrysopogon* Brenan, *A. spekei* C. B. Cl., and *A. pedunculosum* C. B. Cl. Their main distinctions are given in Table 1.

A. nicholsonii C. B. Cl., although a member of this group of species, is not in Table 1, because I feel considerable doubt about its specific distinctness from *A. pedunculosum* C. B. Cl., to which it is clearly related. Extremes of *A. nicholsonii* C. B. Cl., with their somewhat narrower leaves than *A. pedunculosum*, rather laxer inflorescences with rather larger pedicels and apparently paler flowers, almost linear upper bracts and bracteoles with conspicuously dilated tips, and prominently glandular sepals, may give little difficulty in recognition, but most of the characters seem inconstant.

Aneilema hirtum *A. Rich.*, Tent. Fl. Abyss. 2: 343 (? 1851); C. B. Cl. in DC., Monogr. Phan. 3: 228 (1881); C. B. Cl. in Thiselton-Dyer, Fl. Trop. Afr. 8: 74 (1901).

A. whytei C. B. Cl. in Thiselton-Dyer, Fl. Trop. Afr. 8: 72 (1901).

TABLE 1. Differences between 5 closely related species of *Aneilema*

	A. richardsae	*A. hirtum**	*A. spekei*	*A. pedunculosum*	*A. chrysopogon**
Leaves	Linear to linear-lanceolate, 0·3–1 cm. wide, not 'petiolate'.	Lanceolate to ovate-lanceolate, the larger ones on each plant about 1–2·3 cm. wide, not 'petiolate'.	Lanceolate to ovate- or elliptic-lanceolate, mostly 1·5–3·2 cm. wide, not 'petiolate'.	Ovate to ovate-elliptic, 1·5–4 cm. wide, distinctly 'petiolate'.	Lanceolate to lanceo-late-elliptic, 1–2·4 cm. wide, not 'petiolate'.
Leaf-sheaths	Margins with hairs less than 0·5 mm. long, not exceeding those on leaf-surface.	Margins ciliate with stiff hairs about 1–3 mm. long.	Margins ciliate with stiff hairs about 1–3 mm. long.	Margins ciliate with stiff hairs about 1–3 mm. long.	Margins ciliate with stiff hairs about 1–3 mm. long.
Inflorescence	Long hairs absent from inflorescence. Pedicels and inflores-cence-axes conspicu-ously tinged with indigo-blue.	Long hairs usually present on main axis and lateral branches, sometimes absent. Blue pigment absent or slight on pedicels and axes of inflorescence.	Long hairs absent from inflorescence (hairs all less than 0·5 mm. long). Blue pigment absent or slight on pedicels and axes of inflorescence.	Long hairs present or absent from inflorescence. Blue pigment absent or slight on pedicels and axes of inflorescence.	Long hairs present on inflorescence, sometimes few.
Bracts	Ovate-triangular, without a linear upper part thickened at tip.	Narrowed to a linear upper part which is thickened enlarged and probably glandular at tip.	Ovate-triangular, without a linear upper part thickened at tip.	Narrowed to a linear upper part which is thickened enlarged and probably glandular at tip. Lower bracts sometimes divided into several similar apices.	Narrowed to a linear upper part which is thickened enlarged and probably glandular at tip.
Pedicels	2–3·5 mm. long.	2–3 mm. long.	Usually 4·5–7 mm. long.	1·5–2·5 (–4, but rarely) mm. long.	2·5–3·5 mm. long.
Sepals	Shortly pubescent outside.	± pubescent outside, sometimes sparsely so.	Shortly pubescent outside.	Glabrous or sometimes slightly pubescent outside.	Pubescent outside.
Capsule	3–4·5 × 2·5–3 mm., oblong.	3·5–5 × 3·5–4 mm., elliptic-suborbicular.	About 5 × 3·5 mm., oblong.	4·5–6 × 3 mm., oblong to broadly elliptic.	4–4·5 × 3–3·5 mm., oblong-ellipsoid.

*The distinctions between *A. hirtum* and *A. chrysopogon* are discussed on p. 222–3.

C. B. Clarke wrote in the 'Flora of Tropical Africa' that he had little doubt, from the description of the inflorescence, that *A. hirtum* was a species of *Floscopa*, and that in his treatment in DC., Monogr. Phan. 3 he had confused it with the *Aneilema* that he later described as *A. whytei*.

Through the courtesy of the Director of the Muséum National d'Histoire Naturelle at Paris, I have had on loan the type-specimen (Ethiopia, *Quartin-Dillon & Petit*) of *A. hirtum*, which is unquestionably conspecific with *A. whytei*, which must accordingly bear the earlier name *A. hirtum*. *A. hirtum* is now known from Ethiopia, Uganda, Kenya, Tanganyika Territory and Nyasaland.

Aneilema chrysopogon *Brenan*, sp. nov.; *A. hirto* A. Rich. proxima, floribus majoribus, filamentis staminum fertilium anticorum luteis prope apicem conspicue luteo-barbatis, capsulis oblongo-ellipticis differt.

Herba annua, ut videtur erecta, sparse et praesertim inferne ramosa, usque ad circiter 30 cm. alta. *Radices* e nodis basalibus ortae, fibrosae. *Caules* pilis longioribus nonnullis rectis necnon aliis brevioribus uncinatis breviter pubescentes, satis graciles. *Folia* lanceolata usque lanceolato-elliptica, plerumque 2–6·5 cm. longa, 1–2[–2·4] cm. lata, utrinque sed praesertim subtus inconspicue pubescentia, apice acuta, basi plus minusve rotundata et haudquaquam 'petiolata', marginibus minute serrulatis; vagina clausa, circiter 0·3–0·8 cm. longa, marginibus pilis albidis satis longis ore ciliatis. *Inflorescentiae* terminales, 1·5–4·5 cm. longe pedunculatae, arcte paniculatae, subcapitatae, 0·5–1·7 cm. longae, 1–1·5 cm. latae; axis satis dense puberulus, ut videtur haud caeruleo-coloratus; rami laterales brevissimi, 0·5–3 mm. longi, ut axis vestiti; bracteae basi ramorum insertae, lineares vel basi tantum subito dilatatae, 1 mm. longae, apice ipso subito incrassato brunneo et ut videtur glanduloso; bracteolae bracteis similes. *Flores*: pedicelli 2·5–3·5 mm. longi, pubescentes, basi articulati. *Sepala* 3, subaequalia, extra pubescentia, intus puberula, oblonga, 4·5–5 mm. longa, 2–2·5 mm. lata, plus minusve concavo-convexa, apice cucullato obtuse bigibboso (vel unigibboso). *Petala* 3: duo postica caerulea, 7·5–8 mm. longa, unguiculo circiter 3–3·5 mm. longa, lamina circiter 5–6 mm. longa, 6–7·5 mm. lata; unum anticum circiter 4·5 mm. longum, 1·5 mm. latum (haud explicatum), superne cymbiformi-saccatum, apice cucullatum, basi angustatum sed haud unguiculatum. *Stamina fertilia antica*: duo lateralia filamentis luteis circiter 6·5–8·5 mm. longis apicem versus dense luteo-barbatis aliter glabris, antheris suborbicularibus 1–1·25 mm. longis et latis; unum centrale filamento glabro 4–4·5 mm. longo apice bifurcato et thecas duas separatas late ellipticas circiter 0·5 mm. longas ferente. *Staminodia postica lutea*: duo lateralia filamentis glabris 4–4·5 mm. longis apice bifidis, utroque ramo in corpusculum transverse ellipsoideum 0·6 mm. longum, 0·8 mm. latum desinente; unum centrale filamento 2·5–3 mm. longo, apice bicorpusculare. *Ovarium* pubescens, oblongo-ellipsoideum, apice angustatum, 2 mm. longum, 1 mm. latum, stylo glabro 7·5 mm. longo basi apiceque excepto luteo. *Capsula* bivalvata, sparse glanduloso-pubescens, oblongo-ellipsoidea, 4–4·5 mm. longa, 3–3·5 mm. lata, straminea, apice late rotundata, basi rotundata sed haud stipitata, cellulis epidermidis transverse elongatis. *Semina* 2 pro loculo, irregulariter obtuse trilobata, 1·6–1·75 mm. longa, 1·6 mm. lata, pallide brunnea, testa scrobiculata.

Tanganyika. Ufipa District: Sumbawanga–Chapota road, Kasesi River, in swampy ground, 1650 m., 5 Mar. 1957, *Mrs. Richards* 8462:—annual; stem hairy; leaves with short silvery hairs; flowers blue; stamens yellow.

Northern Rhodesia. Abercorn District: near Mpanda, in sandy soil on edge of track in meadowland, 1520 m., 11 Feb. 1955, *Mrs. Richards* 4471 (K, holotypus):—stem and leaves hairy; flowers bright blue; stamens bright yellow. Kawimbe, in semi-cultivated soil on edge of banana plantation, 1680 m., 25 Feb. 1957, *Mrs. Richards* 8314:—flower with upper petals bright blue, lower opaque; stamens yellow; style long, yellow; calyx hairy. Track, Kaka village near Kawimbe, damp ground close to mushitu, 1680 m., 4 May 1957, *Mrs. Richards* 9550:—annual; flowers in small heads; two upper petals very bright blue; stamens very long, yellow.

Aneilema chrysopogon is certainly most closely related to *A. hirtum* A. Rich. The differences in the floral parts between the two species can be seen from the following notes on *A. hirtum* taken mainly from spirit material (Uganda, *Lind* 343; Kenya, *Tweedie* 467):—Sepals 3–4 mm. long. Posticous petals about 4 mm. long, with lamina about 2·5 mm. long and wide; anticous petal 3·5 mm. long, 1·75 mm. wide, similar in shape to that of *A. chrysopogon*. Anticous lateral fertile stamens with greenish-white tinged reddish-purple filaments 3·5–5 mm. long with reddish-purple hairs; central one about 2·5 mm. long. Posticous staminodes: lateral filaments 2·5 mm. long, central one 2 mm. long. Style greenish-white tinged violet, 3·5–4·5 mm. long. Capsule normally with 1 reniform seed per loculus, sometimes with 2.

Aneilema calceolus *Brenan*, sp. nov.; ob flores (propter axes cincinnorum non evolutas) plerumque ut videtur in axillis superioribus fasciculatos et ob petalum anticum cucullato-cymbiforme prope *A. clarkei* Rendle ponenda, sed foliis plerumque subacutis, pedicellis post anthesin per totam longitudinem aequaliter curvatis haud apice tantum deorsum reflexis ubique puberulis nec inferne glabris, petalis multo minoribus pallide lilacinis vel rubellis haud caeruleis, capsulis apice retusis haud breviter apiculatis differt.

Herba verisimiliter perennis, diffusa, praesertim e nodis inferioribus crebre ramosa, usque ad circiter 20 cm. alta. *Radices* e nodis infimis ortae, fibrosae. *Caules* pilis uncinatis breviter et inconspicue pubescentes, satis graciles. *Folia* quam internodia plerumque multo breviora, pro genere parva, elliptica, 1·5–3·5 cm. longa, 0·9–1·3 cm. lata, utrinque puberula necnon nervis longitudinalibus manifestis percursa, apice plerumque subacuta, basi angustata sed haud vel vix 'petiolata', marginibus minute denticulato-ciliolatis sed inferne vaginam versus pilis longis paucis ciliatis; vagina nisi foliorum supremorum clausa, 3–6 mm. longa, circiter 3 mm. diametro, extra breviter pubescens vel puberula, ore pilis longis albidis ciliata. *Inflorescentiae* ut videtur terminales et sessiles cum floribus in axillis foliorum supremis fasciculatis, sed vero e fasciculis fere sessilibus circiter 3–5-floris i.e. cincinnis quorum axes non evoluti compositae; fasciculi in axillis solitarii vel saepius 2–6 aggregati, nonnunquam cum ramis axillaribus usque ad 6 tandem iterum ramosis fasciculos solitarios vel aggregatos etiam ferentibus ut inflorescentiam ramosam irregularem circiter 3 cm. longam efficiant; fasciculi basi bracteati, bracteis ciliatis et foliis similibus sed reductis; bracteolae ob axem cincinni haud productum fasciculatae et imbricatae, triangulares, circiter 2–3·5 mm. longae et 2 mm. latae, glabrae, apice acutae. *Flores*: pedicelli ubique pilis minimis uncinatis patenter puberuli, 5–9 mm. longi, post anthesin per totam longitudinem aequaliter curvati et usque ad 12 mm. longi. *Sepala* 3, subaequalia, extra patenter puberula, ovato-elliptica, valde concavo-convexa, 3 mm. longa, circiter 2 mm. lata, apice rotundata; sepalum posticum

(superius) dorso prope apicem gibberibus glandulosis 2 collateralibus notatum; antica (inferiora) gibbere unico notata. *Petala* 3, pallide lilacina [vel rubella]; duo postica late obovato-elliptica, 5–6 mm. longa, 3·5 mm. lata, basi in unguiculum circiter 1 mm. longum angustata; unum anticum obovatum, 5 mm. longum, 2·5 mm. latum, ob margines inflexos conspicue cucullato-cymbiforme, stamen anticum centrale (? an semper) involvens. *Stamina fertilia antica* glabra; duo lateralia filamentis sigmoideis 4 mm. longis, antheris ellipsoideis 1·25 mm. longis 0·75 mm. latis; unum centrale filamento 3 mm. longo, anthera 2 mm. longa 1·5 mm. lata curvata. *Staminodia postica*: duo lateralia filamentis glabris 2·5 mm. longis apice corpusculis duobus brevissime stipitatis ellipsoideis vel ovoideis basi unilateraliter affixis et hinc ut videtur pendulis; unum centrale absens. *Ovarium* glanduloso-puberulum, stylo glabro 6·5 mm. longo; aut in floribus ♂ ovarium rudimentarium, stylo circiter 1 mm. longo. *Capsula* trivalvata, glanduloso-puberula, late obovoidea, valvis late oblongis 3–3·5 mm. longis 1·75–2·5 mm. latis, albida, nitidula, basi rotundata, haud stipitata, apice truncata et retusa, cellulis epidermidis plus minusve transverse linearibus. *Semina* plerumque 1 pro loculo, pallide brunnea, obtuse trilobata vel subreniformia, 1·25–1·5 mm. longa et lata, testa inconspicue scrobiculata.

Kenya. ? Lamu or Tana River District: Lake Dumi, 13 Feb. 1893, *J. W. Gregory s.n.* (BM).

Tanganyika. Tanga District: 8 km. SE. of Ngomeni, open areas in recently exploited forest patch, 75 m., 31 July 1953, *Drummond & Hemsley* 3561:—forming mats 1 m. or more in diameter, creeping, rooting at nodes; flowering branches erect; petals pink; anthers yellow. Near Kange limestone gorge, at edge of sisal plantation and dry evergreen forest among limestone rocks, 70 m., 13 Nov. 1956, *Milne-Redhead & Taylor* 7285 (K, holotypus):—probably a perennial; roots fibrous; stems rooting at lower nodes; petals, filaments and styles pale lilac; anthers of long filaments blue, 2 others yellow and one large one orange.

Aneilema calceolus, whose epithet is given in allusion to the slipper-like shape of the anticous petal, a feature I have seen elsewhere in the genus only in *A. clarkei* Rendle, is most closely related to the latter species. Until recently *A. clarkei* has remained a very imperfectly known species with little material available, and I was not at first disposed to separate *Drummond & Hemsley* 3561 from it. Additional material of *A. clarkei* and *A. calceolus* shows that my first opinion was wrong and that *A. calceolus* is specifically separable.

Cyanotis D. Don

Cyanotis paludosa *Brenan*, sp. nov.; proxima *C. longifoliae* Benth. praesertim formis subglabris, sed domicilio paludoso, habitu saepius robustiore, planta basi crasse rhizomatosa, radicibus fibrosis saepe e nodis infimis ortis, sepalis apice haud dense comatis differt.

Herba perennis, robusta, ut videtur erecta, subsimplex vel praesertim superne sparse ramosa, 0·6–1·2[–1·8] m. alta. *Caules* e rhizomate incrassata radices fibrosas emittente orti, purpureo-virides, usque ad circiter 7[–13] mm. diametro, inferne praesertim pilis longis (usque ad 4 mm.) tenuibus et mollibus inconspicue patenter pilosi, nodis infimis saepe radices fibrosas emittentibus. *Folia* linearia, 4–13[–30] cm. longa, circiter 1–1·2[–1·6] cm. lata, glabra vel subglabra, apice acuta; vagina 2–5 cm. longa, saltem inferiore parte clausa, extra subglabra vel inferne sparse pilosa. *Inflorescentiae* capitatae, 1·5–2·5[–3] cm. longae et latae, terminales et in axillis 2–3 supremis, sessiles vel subsessiles, vel infima pedunculo usque ad 7·5[–9] cm. longo suffulta; bracteae subtendentes inferiores basi dilatatae tunc in

laminam foliaceum usque ad 3·5[–6] cm. longam 5 mm. latam angustatae, superiores [saepe] ovato-acuminatae 1·5–2·2[–2·5] cm. longae, 0·8–1·6 cm. latae, basi ciliatae [vel glabrae]; capitula e cincinnis pluribus congestis sessilibus vel brevissime pedunculatis composita; cincinni ipsi basi bracteati, bracteis ovatis ciliatis; bracteolae in utroque cincinno biseriatae, in utraque serie circiter 5 [–8], imbricatae, ovatae vel ovato-lanceolatae, leviter falcatae, circiter 9–12 mm. longae, 3–5 mm. latae, apice acutae, glabrae [vel sparse ciliatae]. *Sepala* elliptica, 5·5–6 mm. longa, 2·5–3 mm. lata, dorso carinata, glabra vel subglabra [vel parce pilosa], apice haud dense comata. *Corolla* pallide caerulea, 10 mm. longa, lobis ovatis 4·5 mm. longis 3 mm. latis. *Stamina* 6, pallide caerulea, filamentis circiter 10 mm. longis superne barbatis, antheris ellipsoideis 1 mm. longis 0·7 mm. latis. *Ovarium* oblongum, trigonum, 1·25 mm. longum, 1 mm. latum, superne dense pubescens, stylo 10 mm. longo barbato, stigmate e basi ellipsoideo acuminato 1·5 mm. longo 0·5 mm. lato. *Capsula* trivalvata, oblongo-ellipsoidea, 5·5 mm. longa, 2·5 mm. lata, superne pubescens. *Semina* 2–3 pro loculo, quadrata, brunnea, 1·5 mm. longa, 1·25 mm. lata.

Uganda. Masaka District: Katera, edge of swamp, 1160 m., 23 June 1935, *A. S. Thomas* 1287:—frequent, stoloniferous; flowers pale blue. Lake Nabugabo, in swampy areas near the lake with water still standing at the time, 1130–1160 m., Aug. 1935, *Chandler* 1412:—height 60–75 cm.; leaves 22–25 cm. long, about 2 cm. wide; stem-base thickened; flowers light blue. Mile 13, Masaka road, marshy outskirts of swamp, 1170–1190 m., June 1937, *Chandler* 1671:—height 60 cm. or little more; flowers bright pale blue. Mengo District: Kirerema and Kiruru, grassy swamps, 1220 m., Sept.–Oct. 1914, *Dummer* 2691 (BM, K):—to 2 m.; flowers pale blue. Bombo road, May 1929, *Liebenberg* 824:—vernacular name (Luganda) 'manda'. Kiagwe, Mukono, edge of swamp, 1200 m., Oct. 1931, *Hansford in Snowden* 2281:—1 m. flowering axis, hairy below; leaves mostly all radical, up to 30 × 5 cm., fleshy, glabrous. Without precise locality, *Maitland* 39 AB.

Kenya. Trans-Nzoia District: Kitale, open marshland with roots often in pools of water, 1890 m., 16 Sept. 1950, *Wiltshire* 54 (K, holotypus):—tall, sturdy plant with heavily jointed stems 60–120 cm. high greenish-mauve and slightly hairy; root is a heavily ridged rhizome with a number of roots all along it; smooth, thick, lanceolate leaves clasp the stem alternately, pale green shaded with mauve; tight inflorescences in clumps in the axils of the leaves and at the top of the main stem; these bear the very dainty pale blue 3-petalled flowers with a bunch of fluffy blue stamens; no scent.

Tanganyika. Ufipa District: Chapota Swamp, in dense swamp among tall coarse grass, 1650 m., 6 Mar. 1957, *Mrs. Richards* 8498:—height over 1·5 m.; stems with long whitish hairs; bracts brown and green; flowers azure-blue, with 3 lilac petals.

Cyanotis paludosa is certainly most closely related to *C. longifolia* Benth., a species with an amazing range of variation which has been carefully and critically discussed (as far as West Africa is concerned) by Schnell in Bull. I.F.A.N. 29, sér. A: 727–750 (1957). In spite of this variability certain features are constant, notably the numerous tuberously thickened root-fibres radiating from the stock, and the sepals densely barbate above. *C. paludosa* can only be confused with the most robust, subglabrous variants of *C. longifolia*, such as have been placed under var. *deightonii* (Hutch.) Schnell (*C. deightonii* Hutch.), but from these and from all other variants of *C. longifolia* it differs by being rhizomatous and having glabrous or only sparsely hairy sepals. Its habitat, in swamps, is also very different from that of *C. longifolia*.

Floscopa Lour.

Floscopa confusa *Brenan*, sp. nov.; inter *F. rivularem* (A. Rich.) C. B. Cl. et *F. africanam* (P. Beauv.) C. B. Cl. var. *majusculam* C. B. Cl. ponenda, ab illa vaginis foliorum oribus exceptis glabris vel nonnunquam marginibus connatis sparse pubescentibus, foliis inferne sensim angustatis sed vix

petiolatis, sepalis brevius pubescentibus, ab hac foliis vix petiolatis etsi inferne angustatis, bracteolis majoribus, sepalis extra dense vestitis, capsulis brevissime stipitatis differt.

Herba diffusa, usque ad circiter 60[–150] cm. alta, radicibus omnibus fibrosis e nodis inferioribus caespitosim ortis. *Caules* singuli, praeter inflorescentias simplices, glabri vel superne inflorescentias versus subglabri. *Folia* omnia caulina, lineari-lanceolata, plerumque circiter [5–] 6·5–13 cm. longa, 0·5–1·7 cm. lata sed superne in bracteas foliaceas minores sensim transeuntia, utrinque inconspicue puberula [vel subglabra], apice longe attenuato-acuta, basi vaginam versus angustata sed vix petiolata; vaginae ipsae inferne longiores, usque ad circiter 2·7 cm. longae et circiter 6–7 mm. diametro, clausae, ore ciliatae, extra glabrae vel marginibus connatis sparse pubescentibus; folia suprema, i.e. bracteae, ad circiter 1 × 0·2 cm. decrescentia. *Inflorescentiae* terminales, satis densae et multiflorae, paniculatae, pilis flexuosis apice haud vel inconspicue glandulosis dense et breviter pubescentes, indumento circiter 0·25–0·5 mm. longo, [5–] 6–10 cm. longae, [1·5] 3–4 [–5] cm. latae; ramuli laterales inflorescentiae 1–2·2[–3·5] cm. longi, simplices vel ramulos paucos gerentes, fere usque ad basim floriferi; bracteolae scariosae, irregulariter suborbiculares, circiter 0·75 mm. longae et latae, margine sparse ciliolatae et paulum erosae, sine vaginis. *Flores* secundi, scorpioideo-racemosim dispositi, pallide purpurei; pedicelli 2–3 mm. longi, pubescentes, basi articulati. *Sepala* 3, extra plus minusve convexa, elliptica vel oblongo-elliptica, apice obtusa, 2·75–3 mm. longa, 1·25–1·7 mm. lata, extra pilis apice plus minusve elongato-capitatis glanduloso-pubescentia. *Petala* 3; unum posticum oblongo-lineare, circiter 2·5 mm. longum, 0·4 mm. latum; duo antica elliptica, 2·5–3 mm. longa, 1·5 mm. lata. *Stamina* fertilia 6, filamentis 2·5–3 mm. longis, antheris 0·3 mm. longis 0·5–0·75 mm. latis; tria antica filamentis circiter 2·5 mm. longis. *Ovarium* compressum, suborbiculare, glabrum, circiter 1 mm. diametro, basi stipite circiter 0·25 mm. longo, apice stylo circiter 3 mm. longo; loculi uniovulati. *Capsula* griseo-brunnea, nitidula, 2·5 mm. longa, 2·25–2·5 mm. lata, basi in stipitem circiter 0·5 mm. longum angustata, parte centrali seminifera oblata circiter 2 mm. longa 2·25–2·5 mm. lata. *Semina* pallide griseo-purpurea, reniformi-semiellipsoidea, 1·3–1·75 mm. longa, 0·75–1 mm. lata, costis radialibus circiter 11–15[–16] perobscuris sed haud interruptis notata.

British Cameroons. Adamawa Division, Mambila District: Ngel Nyaki, beside stream near village in muddy ground, 1650 m., 20 Jan. 1958, *Hepper* 1719 (K, holotypus):—straggling herb c. 60 cm. high, ascending; stems rooting at lower nodes, purplish, green above and purplish at nodes and on leaf-sheaths; inflorescence glandular-viscid; calyx mauvish; mature capsule glossy brown.

Belgian Congo. Parc National de la Garamba, piste centrale vers km. 22, 700–800 m., 12 Oct. 1951, *De Saeger* 1440. Parc National de la Garamba, le long de la rivière Wilibadi, 700–800 m., 25 Sept. 1950, *Demoulin* 110.

Uganda. Bunyoro District: Bujawe, semi-prostrate in water in papyrus swamp, Nov. 1939, *Sangster* 574:—succulent-stemmed herb. Masaka District: Lake Nabugabo, edge of lake, 1140–1160 m., Aug. 1935, *Chandler* 1410:—90–150 cm. or more high; stems reddish-purple; flowers deep mauve. Mengo District: Entebbe, common, 1902, *Mahon s.n.* Entebbe, 22 Apr. 1905, *Bagshawe* 681 (BM). Entebbe region, Mar. 1923, *Maitland* 683:—vernacular name 'nanda eyomukilinda'. Kirerema, in swampy situations, 1220 m., 10 Aug. 1913, *Dummer* 97 (BM):—pale blue. Namanve, 1130 m., Jan. 1935, *Eggeling* 1587 *in F.H.* 1527. District uncertain: Ntaka– . . . ?, in grassy swamp, 10 Aug. 1913, *Dummer* 97:—flowers pale blue-pink.

This species has in the past been much confused with *F. rivularis* (A. Rich.) C. B. Cl. *F. confusa* is, however, quite easily separable from *F. rivularis* by its leaves which are narrowed in their lower part towards the sheath and

not suddenly contracted into the sheath from a broad rounded base as in *F. rivularis*, nor yet distinctly petiolate as in *F. africana* (P. Beauv.) C. B. Cl. The glabrous or subglabrous leaf-sheaths, the more shortly pubescent sepals, and the very obscurely ribbed seeds are also characteristic of *F. confusa*.

What is referred to as *F. rivularis* in Troupin, Fl. Spermat. Parc Nat. Garamba 1: 170 (1956), is partly at least (*De Saeger* 1440) *F. confusa*.

Floscopa tanneri *Brenan*, sp. nov.; affinis *F. tuberculatae* C. B. Cl., habitu multo robustiore, foliis basi rosulatis et ibi maximis superne decrescentibus, vaginis longioribus, floribus majoribus, stylo multo longiore distinguenda. A *F. rivulari* (A. Rich.) C. B. Cl. radicibus e caudice nec e nodis ortis, foliis ut supra, capsulis apice conspicue acuminatis, costis seminis interruptis differt.

Herba erecta vel basi tantum decumbens, [15–]45 cm. alta, radicibus crasse fibrosis omnibus e caudice ortis. *Caules* singuli, praeter inflorescentias simplices, glabri vel subglabri sed superne inflorescentias versus pubescentes. *Folia* basi plus minusve rosulata et ibi maxima, lineari-oblanceolata, 9–26 cm. longa, 1–2·1 cm. lata, glabra vel laxe pubescentia, apice breviter attentuato-acuta, basi vaginam extra glabram per 5–20 mm. clausam circiter 3–5 mm. diametro versus sensim angustata, marginibus ut videtur paulum undulatis; folia caulina sensim decrescentia; suprema, i.e. bracteae, circiter 0·4–3 cm. longa, 0·2–1·2 cm. lata. *Inflorescentiae* terminales, satis confertae, pilis flexuosis apice glanduliferis dense pubescentes, [2–]8 cm. longae, [2·5–]10 cm. latae; ramuli laterales inflorescentiae [1·5–]5·5 cm. longi, simplices vel ramos usque ad 3 gerentes; ramuli ultimi usque fere ad basim dense floriferi, nonnunquam breviter nudi; bracteolae scariosae, minimae, obovatae, plerumque 0·75–1·25 mm. longae, 0·5 mm. latae, margine saepe erosae vel laceratae, sine vaginis. *Flores* secundi, scorpioideo-racemosim dispositi, purpurei; pedicelli 0·75–1·5 mm. longi, glanduloso-pubescentes, basi articulati. *Sepala* 3, extra convexa, elliptica, apice obtusa, 3–4 mm. longa, 2–2·5 mm. lata, antico quam alia paulo latiore. *Petala* 3; unum posticum oblongo-lineare, 3·5 mm. longum, 0·5 mm. latum; duo antica obovata, 3·5–5 mm. longa, 2·5–4 mm. lata. *Stamina* 6, tria postica filamentis 3·5–7 mm. longis, antheris 0·75–0·8 mm. longis 0·6–0·7 mm. latis ellipsoideo-suborbicularibus; tria antica filamentis 2·5–4·5 mm. longis, antheris 0·5 mm. longis 0·75 mm. latis oblatis; thecae omnes subparallelae. *Ovarium* compressum, suborbiculare, glabrum, circiter 1 mm. diametro, basi stipite circiter 0·25 mm. longo, apice stylo circiter 7 mm. longo; loculi uniovulati. *Capsula* griseo-brunnea vel grisea, nitidula, circiter 3·5 mm. longa, 2·5 mm. lata, apice breviter acuminata, basi in stipitem circiter 0·5 mm. longum angustata, parte centrali seminifera suborbiculari circiter 2·5 mm. diametro. *Semina* pallide grisea, reniformi-semiellipsoidea, 1·25–1·5 mm. longa, 0·75 mm. lata, costis radialibus circiter 12–13 hic illic interruptis ut in *F. tuberculata*.

Congo Republic. Haut-Katanga: shore of Lake Tanganyika, 31 May–1 June 1908, *Kassner* 3039 (BM), 3040 (BM, K).

Tanganyika. Mwanza District: Katunguru, Karemo [probably Katungulu, Karumo], marsh, 1130 m., 7 Feb. 1934, *Rounce* 339. Mwanza, Bukumbi, Mwasonge, in fine floury sand, rooting in permanent water-seepage in thick grass, 1140 m., 25 Sept. 1952, *Tanner* 1023 (K, holotypus):—thick, fleshy, upright, single-stemmed plant, 45 cm. high, in flower; deep purple-red, not aromatic. Nyakaliro, in seasonal swamp near lake, 9 Apr. 1957, *Akiley* 72:—herb up to 45 cm. high; flowers yellow and purple.

Clearly related to *F. tuberculata*, but very much more robust, having the appearance of being a perennial, while *F. tuberculata* is certainly an annual. *Kassner* 3040 is a poor specimen but I believe the same species. *Tanner* 1023 does not show open flowers, perhaps owing to the time of collection, but *Akiley* 72 does.

Floscopa aquatica *Hua* in Bull. Mus. Hist. Nat. Paris 1: 122 (1895).

F. myosotoïdes Hutch. in Hutch. & Dalz., Fl. W. Trop. Afr. 2: 311 (1936), *anglice descripta*; et in Bull. Misc. Inf. Kew 1939: 241 (1939), *latine descripta*; Brenan in Kew Bull. 7: 457 (1952).

Floscopa aquatica Hua was, from description, made a synonym of *F. axillaris* C. B. Cl. by Clarke in Fl. Trop. Afr. 8: 87 (1901).

Recently, thanks to the kindness of Professor A. Aubréville, I have been enabled to examine the type-specimen of *Floscopa aquatica* Hua on loan. Hua, by oversight, omitted to mention any specimen or locality to accompany his description. The specimen sent was *Thollon* 316, collected in July–August 1885 on the Mission P. Savorgnan de Brazza, in 'Afrique Occidentale (Congo et Ogôoué)'. The gathering was actually made on the River Alima in the Moyen Congo.

The material agrees well with *F. myosotoïdes* Hutch. from West Africa. The thin-textured leaves with characteristic wavy margins and not or scarcely narrowed at base, the short glabrous sheaths, and the rather poorly developed inflorescences are common to *Thollon* 316 and *Floscopa myosotoïdes*. Although the Thollon specimen has no capsules, I do not think that there is any doubt of its identity. I do not consider it to be *F. axillaris*, as Clarke suggested, on account of differences in the habit—the roots coming from several nodes successively, suggesting a trailing or floating position, and not all basal—and also the thinner foliage and the appearance of the inflorescence.

Since *F. aquatica* is earlier than *F. myosotoïdes*, it must be adopted. The geographical range of the species, hitherto considered to be from the Guinea Republic and Sierra Leone to Nigeria, is now considerably extended southwards.

Tomatoes, Cucumbers & Melons.*—A little book of helpful hints written for those who grow tomatoes and cucumbers and for those who may wish to grow melons. The author has had much experience in growing tomatoes, cucumbers and melons, and his book will form a useful guide to the cultivation of these plants. It is illustrated by 17 line-drawings and includes lists of recommended varieties.

H. S. Marshall

* *Tomatoes, Cucumbers and Melons*. 'Amateur Gardening' Handbook No. 35. By A. G. Puttock. Pp. 92, 17 line-drawings. London: W. H. & L. Collingridge Ltd., 1959. Price 4s.

An *Uncinia* from South Georgia

D. Philcox

The purpose of this note is to record the addition of a species of *Uncinia* to the South Georgia flora, which comprises only fifteen known phanerogams. The sedge was collected by Mr. Jeremy Smith, who was a member of the 1957–1958 Falkland Islands Dependencies Survey and is described below and named in his honour, he having been killed in a climbing accident in 1959.

This very surprising new species is entirely confined to the Cumberland Bay area, occurring quite frequently in the *Festuca* moorland, which is dominated by *Festuca erecta* Urville, growing in normal well-drained sites between the elevations of 3 m. at Hamberg Glacier and 330 m. on Osmic Hill.

Uncinia smithii appears to be more closely allied to *U. brevicaulis* Thou. than to any other species, but differs in having elliptic-ovate female glumes with eciliolate margins, compared with the oblong-ovate glumes with ciliolate margins of *U. brevicaulis*. It also differs very strikingly from *U. brevicaulis* by its low habit and folded, strongly reflexed leaves which are generally longer than the culms.

Uncinia smithii *Philcox*, sp. nov. *U. brevicauli* Thou. affinis, sed habitu nano, glumis femineis elliptico-ovatis marginibus sub lente forti eciliolatis differt.

Herba perennis, rhizomate longo repente culmos numerosos emittente, radicibus fibrosis; internodia rhizomatis gracilia, saepe arcuata, 2·5–6 cm. longa, circiter 1·5 mm. crassa, squamis brunneis striatis obtecta, striis senectute solutis. *Culmi* solitarii, 2–6 cm. alti, nonnunquam curvati, laeves, trigoni. *Folia* multa, culmos superantia, recurva, plicata, 4·5–11 cm. longa, 1·5–2·2 mm. lata, in apicem acutissimum tenuissimum attenuata, marginibus setulis minutis ascendentibus praeditis, ceterum glabra, valde nervosa; vaginae late albo-marginatae, foliorum exteriorum plus minusve brunneae striatae. *Spica* solitaria, terminalis, androgynaecea, ebracteata, peranguste elliptico-linearis, 1–2 cm. longa, 2–3 mm. crassa, subdensiflora, parte mascula circiter 0·5 cm. longa, 1·5–2 mm. crassa. *Glumae* femineae elliptico-ovatae, rhachin basi omnino amplectentes, apice acutae vel obtusae, 3–4 mm. longae, circiter 2 mm. latae, in medio costa nervisque utroque latere binis prominulis albis exceptis virides, ceterum pallide albescentes trientibus duobus superioribus plus minusve brunneo-tinctae, margine ipso albo subhyalino, glabrae, marginibus sub lente forti eciliolatis. *Utriculi* anguste elliptico-fusiformes, glumas leviter superantes, 4–5 mm. longi, circiter 1 mm. lati, margine dimidio superiore breviter ciliato, praeterea triente superiore dorsali brevissime pubescentes, dorsaliter lateraliter fortiter binerves. *Styli* basis haud incrassata, persistens. *Rhachilla* glumam 3·5–4 mm. superans. *Achaenium* (immaturum) ellipticum, compressum, circiter 2·5 mm. longum, 1·3 mm. latum, vix rostratum. *Stigmata* 3.

South Georgia. Moraine Fjord, between Harker and Hamberg Glaciers, on 15° slope, alt. 12 m., 10 Feb. 1957, *Jeremy Smith* M.1019 (holotype in Kew Herb.).

An illustrated botanical encyclopaedia in Greek.*—This is an ambitious work (presumably planned to extend to about 10 volumes) designed to cover almost the entire field of plant-knowledge, including taxonomy (phanerogams and cryptogams), anatomy, horticulture, agriculture, forestry, economic botany, medicine, etc. Certain branches, however—*e.g.* ecology—appear to be little touched on. The work is copiously illustrated (there are on the average more than one drawing per page), but the illustrations, evidently drawn from many sources, vary much in quality, some (e.g. vol. 1, fig. 441, 1) being very crude, and others suffering much in reproduction. Some subjects, e.g. *Ampelos* (vines and vine-growing), are very fully treated, this particular article occupying no fewer than 34 pages, with copious information on fungus and insect pests. Information in the taxonomic articles is not always up-to-date; *e.g.* the genus *Agapetes* is stated to contain 30 species, whereas as long ago as 1948 the present reviewer (in Kew Bull. 3: 104) estimated the number as 64–67 (present total about 80). Misprints in the Latin botanical names and authorities seem to be unfortunately numerous: *e.g.*, in vol. 1, *Alectorolophus* '*Sentinesii*' (p. 207), *Anethum* '*qraveoleus*' (p. 438), *Agapetes macrantha* 'Berth Hook.', '*Thibawdia*' *setigera* 'Wdll', *A. moorei* 'Hensl.', *A.* '*spesiosa*' Hemsl. (pp. 29–30), etc. A useful feature is the inclusion of keys to species: in most cases to a horticultural selection from the total world complement in each genus, but in some cases, e.g. *Allium*, *Anthemis*, etc., to the entire representation in the Greek flora.

The work, being in the Greek language, will of necessity find only a limited public outside its country of origin; but for those students, teachers and workers for whom it is primarily intended (and who may be able to afford it!), it will obviously prove a mine of information. We congratulate the author on his enterprise, and express the hope that he will be able in due course to bring this botanical encyclopaedia to a successful conclusion.

H. K. Airy Shaw

Hosts of Fungi in Malaya.—The first host list of plant diseases in Malaya was issued in 1952, as Mycological paper 52, with 282 hosts. The present supplement†, by one of the former authors, adds a further 179 hosts, including Dadap, Jute and Sorghum. Notable increases are recorded in the fungi observed on some economic plants, 12 added to 5 on Pineapple, 12 added to 2 on Sugar Cane, 26 added to 14 on Cacao but they are probably in the main of little economic importance. There is also a list of 17 hyperparasites, mostly on Meliolines and rusts and a list of 14 entomogenous fungi. The index includes 342 species of fungi, 7 nematodes, 1 bacterium and 1 alga.

R. W. G. Dennis

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* Eikonographemenon Botanikon-Phytologikon Lexikon [Illustrated Botanical-Phytological Dictionary]. By Demetrios S. Kavvadas. Vol. 1, *Ava–Apium*. Pp. i–vii, 1–504; text-figures 1–619. Vol. 2, *Apium–Galium*. Pp. 505–1016; text figures 620–1317. Vol. 3, *Galium–Eupatorium*. Pp. [1017–18] 1019–1528; text figures 1318–2097. Vol. 4, *Euptelea–Compositae*. Pp. [1529–30] 1531–2040; text figures 2098–2777. Athens, [1956: obtainable from Author]. Price (per volume, including postage) £4 10s.

† *A Supplement to a host list of plant diseases in Malaya*. Mycological Papers No. 77. By A. Johnston. Pp. 30. Kew: Commonwealth Mycological Institute, 1960. Price 7s. 6d.

Agarici Austro-Americani: I

AGARICUS OF TRINIDAD

Paul Heinemann (Gembloux, Belgium)*

Several colleagues having sent to me material of *Agaricus* from different countries of South America, I am able to start a set of publications on the subject.

The present paper concerns the island of Trinidad which was visited in the autumn of 1949 by my colleague and friend Dr. R. W. G. Dennis who has already published some valuable papers on the fungi of this country. I beg the reader to refer to the first of them (Dennis, 1951) for general remarks concerning geography, climate and vegetation.

I know but two papers bearing directly on the subject. The first by W. A. Murrill (1918) summarizes the knowledge of his time on the *Agaricaceae* of Tropical America; 16 species of *Agaricus* are recorded, 13 of which are new. Unfortunately, as with most old descriptions, they are generally not sufficiently detailed for a later recognition of the species. Later on the types of Murrill's species were examined by A. H. Smith (1940) who gave valuable sketches of their spores and occasionally was able to add some anatomical details.

The second paper, by R. E. D. Baker & W. T. Dale (1951) devoted to the Fungi of Trinidad and Tobago, record seven species, four of them with description. Four names in this list appear to be wrong: *Agaricus campester* (see p. 233), *A. angustifolius* (p. 236), *A. johnstonii* (p. 238) and *A. xanthodermus* (p. 239). With these rectifications and new records the actual number of sufficiently known species of *Agaricus* from Trinidad is now raised to 14.

The key is an empirical one, being based on the most easily observed characters so as to lead the reader quickly to a determination. The species are then dealt with in the systematic arrangement followed in my paper on *Agaricus* of the former Belgian Congo (Heinemann, 1956) to which the reader is referred for details of the classification. However some species are not put in a section or subsection either because they do not fit any of those yet proposed or because they are not completely known. Moreover, some of the new species will necessitate the creation of new subdivisions of the genus but before proposing these I prefer to study all the South American material actually available.

I must add a word on the Schaeffer reaction**. It can be obtained on dried material and is of the utmost value. In the case of bright or deep coloured caps the reaction may be difficult to observe but the following refinement nearly always gives a satisfactory result: a tiny fragment is treated 10 minutes in 10% aniline dissolved in alcohol and then put in a minute drop of HNO_3, 20% aqueous solution, under a cover glass. Observations are made under a high power lens or under the microscope (Schaeffer microreaction).

The quotations of colours refer to Maerz & Paul, 'A Dictionary of Color', ed. 2 (M & P) and to Seguy, 'Code Universel des Couleurs' (S).

* Associé du Fonds National de la Recherche Scientifique de Belgique, Chef de travaux à l'Institut Agronomique de l'État à Gembloux (Belgium).

**This reaction is indicated by "Aniline × HNO_3" in this paper.

KEY TO ALL THE SPECIES OF AGARICUS RECORDED FROM TRINIDAD

A. Entirely white or whitish, at least in young state (subgenus *Agaricus pro parte*):
  I. Aniline × HNO_3: negative or faint:
    (a) Ring cottony, small; cheilocystidia none; spores ellipsoid or ovate:
      1. Habit slender; spores without pore . . 1. **argyropotamicus**
      2. Habit rather stout; spores with a rudimentary apical pore **campester** (p. 233)
    (b) Ring tenaceous, membranaceous, volviform; habit stout; cheilocystidia conspicuous often brown coloured; spores rounded with thick membranes . . . . . 3. **edulis**
  II. Aniline × HNO_3: positive (fire-red) . . . . . 4. **arvensis**

B. Pileus coloured; stem whitish or coloured:
  I. Pileus fleshy, never striate at the margin; stem rather stout (gen. L/d < 10), often solid:
    (a) Pileus surface smooth, fibrillose or squamulose, not woolly with detersile cells; stem naked or only slightly fibrillose (subgenus *Agaricus pro parte*):
      1. Flesh becoming bright yellow when cut, especially at the base of stem; pileus grey, radially fibrillose . . 7. **endoxanthus**
      2. Flesh not becoming yellow or only faintly so when cut:
        *Spores without apical pore:
          §Spores 5·5–7·5 × 3·5–4μ; pileus 6–11 cm. diam., fleshy, with brown fibrillose squamules; aniline × HNO_3: reaction not known . . . . . 5. **trinitatensis**
          §§Spores 4–5 × 3–3·5μ:
            †Aniline × HNO_3: negative; pileus 7 cm. diam. with brown squamules **angustifolius** sensu R. E. D. Baker & Dale (p. 236)
            ††Aniline × HNO_3: positive, pileus smaller, less fleshy, more fibrillose than squamulose:
              : Pileus purplish pink; stem white, slightly cottony below ring . . . . . 6. **purpurellus**
              :: Pileus deep brown; stem smooth, becoming yellowish toward the base . . . . **johnstonii** (p. 238)
        Spores with a rudimentary apical pore, pileus brown fibrillose; stem white, ring fragile; aniline × HNO_3: negative 2. **porosporus
    (b) Coating of pileus and of inferior part of stem cottony-squamulose with detersile cells (subgenus *Lanagaricus*):
      1. Pileus and stem violet coloured . . 8. **violaceosquamulosus**
      2. Pileus and stem yellow, ochraceous or orange coloured:
        *Aniline × HNO_3: positive; pileus and stem cream coloured with bright rufous squamules 11. **ochraceosquamulosus**
        **Aniline × HNO_3: negative:
          §Rather tall; pileus ochraceous brown with brown recurved scales; cells of the scales rather thick and short (20 × 10μ) 9. **ficophilus**

§§Medium sized; pileus cream coloured with orange coloured innate squamules; cells of the squamules more narrow and very much longer . . . . . 10. **rufoaurantiacus**

II. Pileus very thin, sometimes striate at the margin; stem very slender (L/d > 15), always ± hollow (subgenus *Conioagaricus*):

(a) Cheilocystidia capitate; spores with truncate endosporium 14. **cephalocystis**

(b) Not the above characters:

1. Pileus squamulose; ring pendulous; stem white; cheilocystidia present . . . . . 12. **bambusophilus**
2. Pileus silky-fibrillose; ring ascending; stem pinkish; cheilocystidia none . . . . . 13. **dennisii**

Enumeration of species

Subgen. AGARICUS

Sect. Campestres Konr. & Maubl. emend. Sing.

Subsect. Campestres

Agaricus campester *Fr. sensu Lange*, Stud. Agar. Denm. 6: 9 (1926).

The material received under the name *A. campester* as well as that labelled 'Common edible Mushroom' must be referred to the following species. The remark by Baker & Dale (1951 p. 83) that their specimens are somewhat small and that they have rather long stipes corroborates this opinion. *A. campester* must thus temporarily be withdrawn from the list though its occurrence in Trinidad is not impossible.

1. **A. argyropotamicus** *Speg.*, Fung. Arg. novi v. crit. in Ann. Mus. Nac. Buenos Aires 6: 146 (1899); Sacc., Syll. Fung. 16: 118 (1902).—Fig. 1.

A. projectellus Murr. in Mycologia 33: 447 (1941).

Pileus 3–4 cm. diam., not very fleshy, campanulate with truncate apex then expanded and widely umbonate, centre yellowish, whitish elsewhere, nearly smooth; margin fimbriate, extending beyond the gills. *Stem* 3–5 cm. × 4–7 mm., narrowly hollow, slightly thickened toward the base which is clavate or sometimes attenuated, whitish, loosely fibrillose below the ring which is very fragile and whose remains hang frequently at the margin. *Gills* not very crowded, up to 6 mm. wide, ventricose, at first very pale pink then becoming brownish. *Flesh* white, unchangeable when cut; smell and taste medium strong, pleasant, mushroom-like.

Exsiccatum: pileus and stem rufous-cream coloured; gills pale brown; efflorescences rather abundant (specimens rather unripened).

Spores pale brown, 6–7 × 4–5μ, ellipsoid; membranes rather thick; pore none or exceptional (once seen in a spore still attached to a basidium). *Basidia* clavate, 4-spored, 26–32 × 9–10μ, some hypertrophied. *Cheilocystidia* none; edge fertile. *Trama* with numerous oleiferous hyphae. *Surface of pileus* made of cylindrical hyaline hyphae, 5–10μ diam.

Schaeffer microreaction (Aniline × HNO_3): negative on exsiccatum.

Trinidad. Port of Spain, Imperial College of Tropical Agriculture, Savanna, 23.6, 1.7 & 1.11.1957, collector unknown (K).

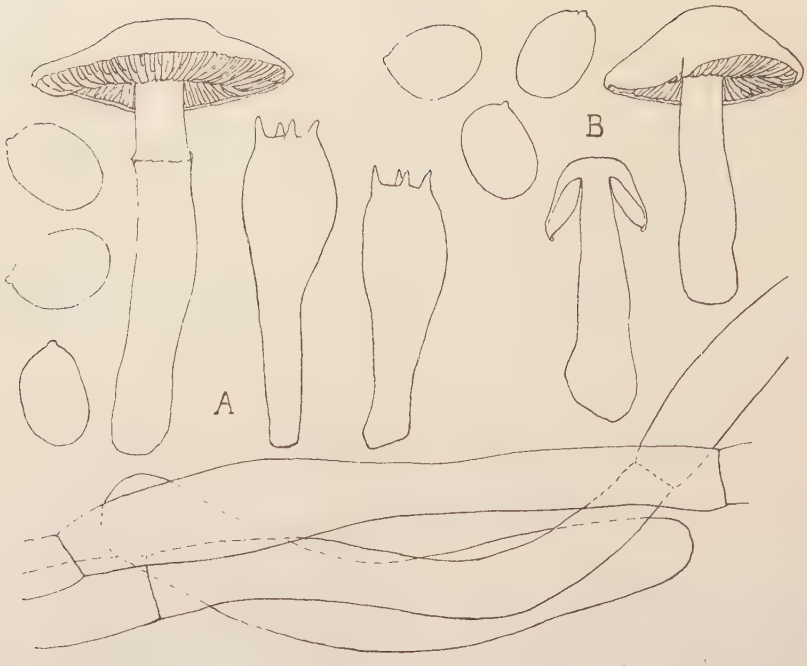

FIG. 1. *Agaricus argyropotamicus*.—A, fruit-body, nat. size; spores × 2000; basidia and hyphae of pileus coating × 1270 (I.C.T.A., 1.11.57). B, young fruit-bodies, nat. size and spores × 2000 (coll. of 1.7.57).

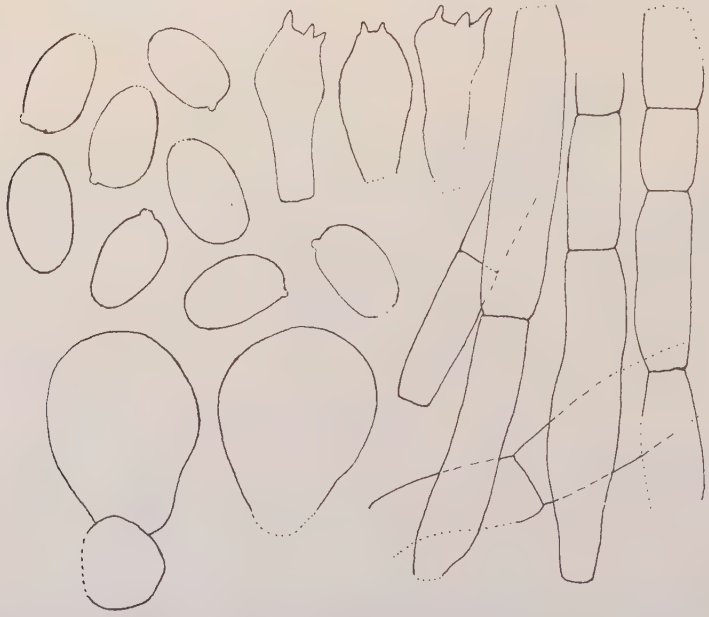

FIG. 2. *Agaricus porosporus*.—Spores × 2000; basidia, cheilocystidia and hyphae of pileus coating × 1000 (holotype).

Remarks. 1. This species is eaten and appraised in Trinidad where it is known as the Common edible Mushroom and therefore has been hitherto taken to be *A. campester* from which it is distinguished by the characters pointed out in the key.

2. The type of *A. argyropotamicus* shows no consistent discrepancies with the specimens of Trinidad except for the aspect of the exsiccatum. That is quite different but it ought to be said that the type is in a very poor state not allowing a thorough examination. *A. projectellus* is described as larger and less slender. There seems to be a group of species around *A. campester* differing from one another by minor characters.

3. On the base of the above tentative synonymy, the species appears to be common in America from Argentina to the South of the U.S.A. (Florida).

4. The habit of *A. argyropotamicus* recalls that of the *Minores* from which it differs by the absence of an almond-like smell and by the negative Schaeffer reaction.

2. **Agaricus porosporus** *Heinem.*, sp. nov.—Fig. 2; pl. 1/1a & 1/1b.

Pileus carnosulus, expansus, obscure umbonatus, albidus, concentrice rufo-squamulosus. Stipes solidus, albidus; annulus albidus, fragilis. Lamellae confertae, latiusculae, roseo-brunneolae. Caro alba; odor funginus. Sporae brunneae, s.m. pallidae, 6·3–7·8 × 3·7–4·8μ, poro apicali praeditae. Cheilocystidia 33–36 × 10–15μ. Aniline × HNO_3: o.

Pileus c. 6 cm. diam., not very thick, expanded, faintly umbonate, whitish with concentrically placed rufous fibrillose squamules. *Stem* 10 cm. × 6 mm. solid, slender, cylindrical, hardly thickened toward base, whitish, with the base recurved and sunk up to 3 cm. in the ground; ring fugacious, white, its remains appendiculate to the pileus-margin. *Gills* crowded, up to 6 mm. wide, ventricose, pale pinkish brown. *Flesh* white, faintly pinkish in pileus and in cortical layer of upper part of stem; smell strong mushroom-like.

Exsiccatum: pileus and stem brownish; gills brown; efflorescences very few.

Spores pale brown, 6·3–7·8 × 3·7–4·8μ, slightly oval; membranes rather thin; apical pore small but easily seen. *Basidia* clavate, 4-spored, c. 18–22 × 8–9μ. *Cheilocystidia* c. 33–36 × 10–15μ (sec. R. W. G. Dennis), hyaline, fugacious, inconspicuous on dried material. *Subhymenium* cellular. *Surface of pileus* made of cylindrical hyphae, 5–10μ wide, slightly narrowed at the septa; membrane thin, smooth or faintly verrucose; reddish brown contents in fresh state; secondary septa fairly frequent.

Schaeffer microreaction (Aniline × HNO_3): negative on exsiccatum.

Trinidad. St. Augustine, solitary on the ground under bamboo, 7.10. 1949, *Dennis* 145 (K, holotype);

Venezuela. Caracas, Botanic Garden, 950 m., on the ground, 20.6. 1958, *Dennis* 1081 (K).

Remarks. 1. The above description is taken from the only sporophore of the type. The specimens from Venezuela are smaller and stouter (cf. pl. 1/2b), the stem being not sunk in the ground. We consider the slender habit of the type as accidental.

2. This species is very near to *A. cuprobrunneus* (Schaeff. & Steer) (Møller, 1950) which has a copper-brown pileus and larger spores also with an apical pore.

Subsect. Hortenses Heinem.

3. **A. edulis** *Vitt.*, Fungh. Mang.: 41, t. 6 (1835); Pilát in Act. Mus. Nat. Pragae 7B: 27 (1951).—Fig. 3.

A. bitorquis Quél. in Ass. Franc. Avanc. Sc. : 4 (1883).
Psalliota rodmani Peck in Ann. Rep. N.Y. State Mus. 36: 45 (1894).
P. edulis (Vitt.) Bechw., Spise og Giftsvampe: 125 (1937); J. Schaeff. in Ann. Myc. 36: 75 (1938); Møll. in Friesia 4: 13 (1950).

Macroscopic features agree with the descriptions by Møller (1950) and Pilát (1951) cited above.

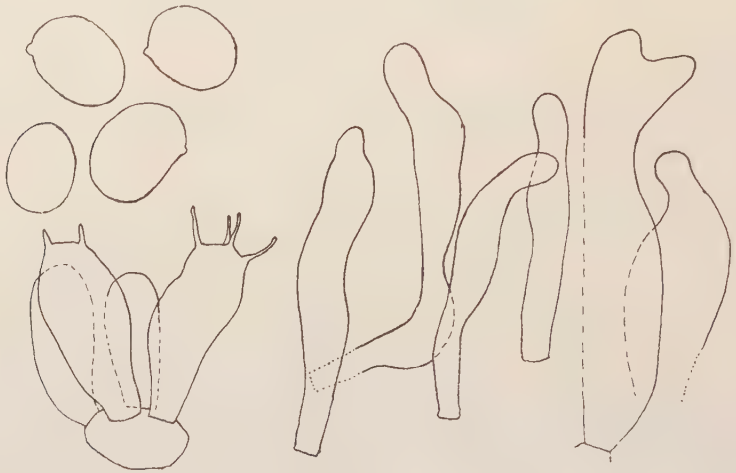

Fig. 3. *Agaricus edulis*.—Spores × 2000; basidia grouped upon a subhymenial cell (far from edge) and cheilocystidia × 1000 (*Dennis* 167A).

Spores very deep brown, 5·8–7 × 4·5–5μ, shortly ellipsoid; membranes thick; pore none. *Basidia* clavate, 4-spored, 18–25 × 8·5–11μ. *Cheilocystidia* irregularly lanceolate, ± flexuose, brown 35–38 × 6–13μ. *Subhymenium* cellular. *Trama* of narrow hyphae which are transversely striped with brown incrustations; all hymenial cells are brown. *Surface of pileus* made of matted, hyaline or faintly yellowish hyphae, (6) 10–17 (22)μ wide; oleiferous hyphae rather frequent.

Schaeffer reaction (Aniline × HNO_3): negative on exsiccatum.

Trinidad. St. Augustine, Imperial College of Tropical Agriculture, on soil in greenhouse, 11.10.1949, *Dennis* 167 & 167A (K).

Remarks. The sporophores from Trinidad agree as closely as possible with those with which I am acquainted in Europe. The microscopic features are taken from *Dennis* 167A.

Sect. Sanguinolenti Schaeff. & Møll.

The collection, *R. E. D. Baker* 1449 (K), on which Baker & Dale (1951) based their determination of *A. angustifolius* Murr. proved to be very distinct from a fragment of the type with which I compared it. The Trinidad fungus seems to belong to the *Sanguinolenti*, near *A. variegans* (Møll.) Møll. (Møller, 1950 p. 203). A comparison with the latter shows however a quite

different anatomy of the coating of the pileus. Having neither a coloured sketch nor detailed notes made from fresh material, I feel unable to give a better determination.

A. angustifolius Murr. is a very tiny and slender mushroom pertaining probably to the subgen. *Conioagaricus*. It must be deleted from the Trinidad list.

Sect. Arvenses Konr. & Maubl. emend. Sing.

Subsect. Silvicolae Kühn. & Romagn.

4. **A. arvensis** *Fr., sensu lato.*

I have not seen material of this species, which Baker and Dale state was included in the 1911 list of J. B. Rorer but has not been reported from the island by subsequent workers. One can but conclude the possible existence in Trinidad of a species belonging to this section.

Fig. 4. *Agaricus purpurellus*.—Spores × 2000; basidia, 2 basidioles upon a subhymenial cell, cheilocystidia and hyphae of pileus coating × 1000 (*Dennis* 423).

Subsect. Augusti Kühn. & Romagn.

5. **A. trinitatensis** *R. E. D. Baker & Dale*, Myc. Pap. 33: 84 (1951).

I have seen only spore-deposits of this species (*R. E. D. Baker* 1430, type (K) & 1435 (K)), from which I suggest it should probably be referred to the sect. *Arvenses*.

To the original diagnosis I can but add that the membranes of the spores are rather thick and that there is no pore. I found the spores 5–7 × 3·7–4·3 μ.

Subsect. Minores Fr.

6. **A. purpurellus** (Møll.) Møll. in Friesia 4: 204 (1952).—Fig. 4; pl. 1/2, p. 248.

[*Psalliota amethystina* sensu Lange, Stud. Agar. Denm. 6:10 (1926), Fl. Agar. Dan. 4: 61, t. 135A (1939), *non* Quél.]

[*Agaricus rubellus* sensu Decary in Bull. Soc. Myc. France 43: Atlas t. 22 (1927), *non* (Gill.) Sacc.]

[*A. johnstoni* sensu R. E. D. Baker & Dale, Myc. Pap. 33: 83 (1951), *non* Murr.]

Psalliota purpurella Møll. in Friesia 4: 193 (1952).

Pileus c. 3 cm. diam., not very fleshy, thin toward margin, purplish pink (M & P: 54K2) in the centre, radially fibrillose, with purplish pink fibrils on paler ground, the margin being narrowly white, minutely fimbriate and slightly extending beyond the gills. *Stem* c. 3·5 cm. × 4 mm., slightly thickened toward base, narrowly hollow, pale pinkish buff, covered with loose white or cream-coloured fibrils below the ring; mycelial strands at base; ring simple, pendulous, fibrous, yellowish near its edge. *Gills* rather crowded, up to 3·5 mm. wide, somewhat remote from stem, rounded at both ends, greyish then deep brown. *Flesh* whitish, light pinkish in the pileus, ochraceous in the stem, especially near the base.

Exsiccatum: pileus purplish brown, somewhat copper-coloured, finely radially rimose; gills deep brown with paler edge.

Spores brown, 4–4·8 × 3–3·3 μ, ellipsoid; membranes rather thick; pore none. *Basidia* clavate or lanceolate, 4-spored, 13–16 × 5–7·5 μ. *Cheilocystidia* hyaline, clavate, 23–30 × 10–13 μ. *Subhymenium* cellular. *Trama* with numerous small orange-coloured concretions. *Surface of pileus* made of yellowish hyphae; squamules made of cells, 20–30 × 4–7 μ, which have hyaline membrane and rose-coloured sap.

Schaeffer microreaction (Aniline × HNO_3): bright orange on exsiccatum (positive).

Trinidad. Morne Bleu, Northern Range, on soil in forest, 4.12.1949, *Dennis* 423 (K); St. Augustine, on the ground under trees, 9.8.1947, *R. E. D. Baker* 1477; St. Joseph, on bamboo stumps, *R. E. D. Baker* 1497 (K).

Remarks. 1. The description is based only on *Dennis* 423 which scarcely differs from *A. purpurellus* in the stem being more fibrillose below ring. On the other hand, *A. dulcidulus* Schulz. sensu Lange (1926, 1939) and Møller (1952) which shows this particularity has a very much paler pileus.

2. The two collections of R. E. D. Baker were previously attributed to *A. johnstonii* (see further on). The published description shows, however, some little concessions to fit better Murrill's diagnosis. The notes taken at the time of collection refer to a mauve-brown pileus and a yellow-brown stipe while the published description refers to a Rood's brown pileus and a tawny stem. On the other hand there seems to be a mixture in *R. E. D. Baker* 1477, the spores of the spore-deposit being notably shorter than those taken from the dried fruit-bodies.

3. *A. goossensiae* Heinem. (1956) of the former Belgian Congo has darker larger spores and a more squamulose pileus, see the plate 17, fig. 4 in 'Flore Iconographique des Champignons du Congo', fasc. 5, 1956.

A. johnstonii *Murr.* in Mycologia 10: 75 (1918).

As stated above, I believe that this species has been erroneously recorded from Trinidad by confusion with the preceding one. It should therefore be deleted from the list of Trinidad fungi. The spores of both species are identical as stated by Baker & Dale though there is a mistake in the measurements

published by Murrill and also by A. H. Smith whose drawing happily dissipates any doubt (1940). One ought to read 4·5 × 3·5 μ in place of 4·5 × 2·5 μ! The species are separated by the colour and the degree of scaliness of the pileus and perhaps also by the coating of the stem below the ring.

Sect. Xanthodermatei Sing.

7. **A. endoxanthus** Berk. & Br. in Journ. Linn. Soc., Bot. 11: 548 (1871).

A. actinorrachis Berk. & Br. sec. Petch in Ann. Roy. Bot. Gard. Peradenyia 6: 320 (1917).

Psalliota endoxantha (Berk. & Br.) Petch, *loc. cit.* 320 (1917).

[*Agaricus xanthodermus* sensu R. E. D. Baker & Dale, Myc. Pap. 33: 85 (1951) *non.* Genev.].

Remarks. The above determination has been made by comparison of the collection *R. E. D. Baker* 1474 (K) with authentic material from Ceylon (Berkeley's herbarium, K).

This collection cannot be *A. xanthodermus* as provisionally determined by Baker & Dale because this well known species has a white cap, a bulbous stem and a peculiar odour. The Trinidad fungus is much like *A. iodolens* Heinem. & Gooss. (Heinemann, 1956) of the Congo but the latter is larger and presents an odour of iodine.

Subgen. LANAGARICUS Heinem.

The species of Trinidad pertaining to this subgenus do not readily fall within the subsection proposed to accommodate the Congo species and I hope to emend the system in a later publication.

8. **A. violaceosquamulosus** *R. E. D. Baker & Dale*, Myc. Pap. 33: 84 (1951).—Fig. 5.

Concerning the macroscopic features I may add but a few details to the original diagnosis:—

Ring formed at the same time by the partial veil and by the general one. *Margin of pileus* narrowly exceeding the gills.

Exsiccatum: all fruit-body mauve brownish with a violet hue, somewhat copper-coloured; gills brown with small brownish granules on the edge (lens × 25!); efflorescences none; spore-deposit (after 12 years) not very dark brown (M & P: 8C11; S: 132–176).

Spores brownish, 5·3–6·2 × 3·4–3·9 μ, ellipsoid or slightly ovate; membranes rather thin, endosporium thickened at the apex. *Basidia* 4-spored, c. 18 × 6 μ. *Cheilocystidia* numerous, hyaline, cylindric-capitate, 40–65 × 4 μ, the spherical apical knob up to 7·5 μ diam. The apical knobs are embedded in a mucilaginous substance which swells in water and in ammonia but does not dissolve even in boiling water. It can however be removed in water or in ammonia after a short treatment with acetone which perhaps dissolves a fatty component of it. This substance forms the small granules that are observable on the gill edge of dried material. *Scales of pileus* made of purplish brownish hyphae, narrowed at the septa, with rather thin, slightly transversely striped membrane; secondary septa not infrequent; cells entire or rarely forked or diverticulated, somewhat detersile, 25–45 × 10–16 μ.

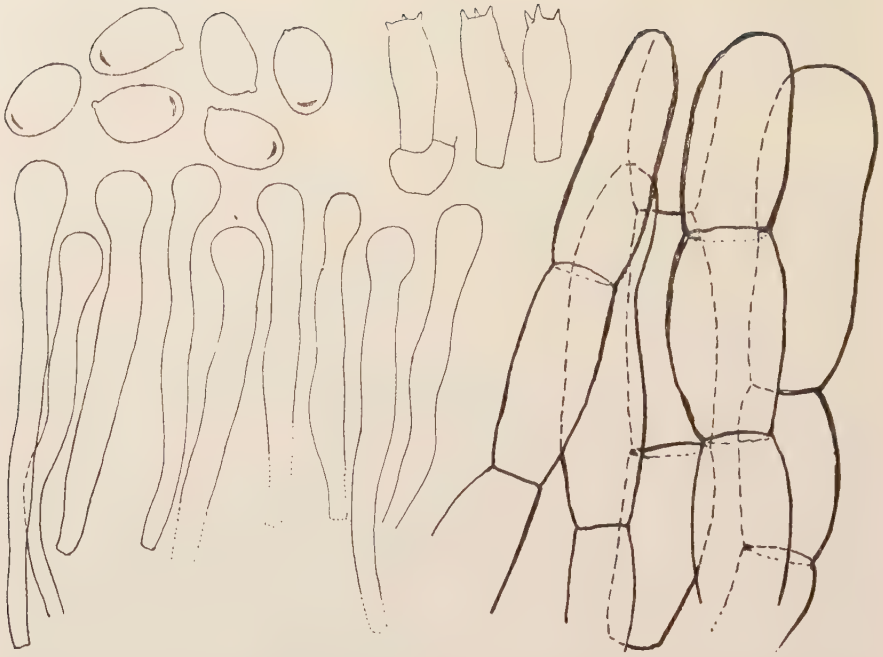

FIG. 5. *Agaricus violaceosquamulosus*.—Spores × 2000; basidia, cheilocystidia and hyphae of pileus coating × 1000 (holotype).

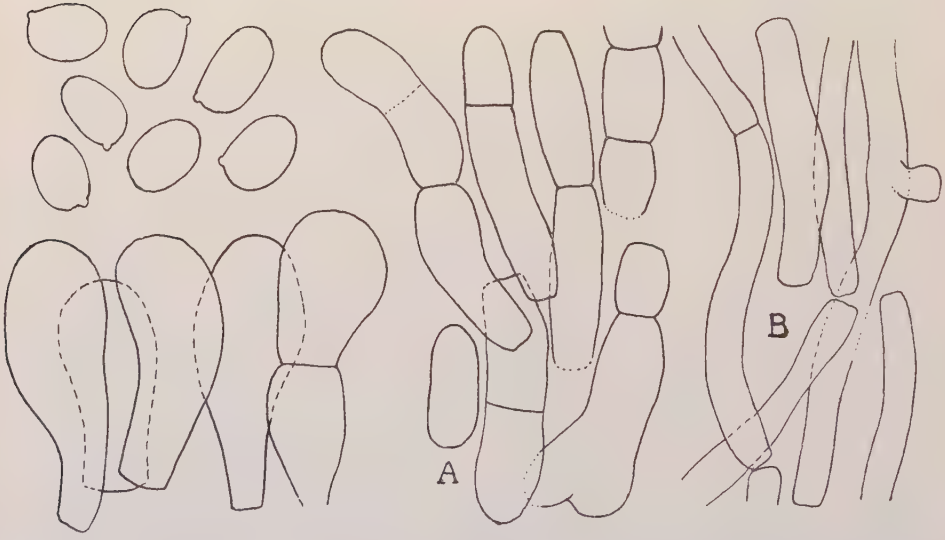

FIG. 6. *Agaricus ficophilus*.—Spores × 2000; cheilocystidia × 1270; cells of scales of pileus (A) and underlying hyphae (B) × 1000 (holotype).

Schaeffer microreaction: probably negative, not observable owing to the reddish colour that the tissues assume in HNO_3.

Remarks. 1. The above descriptive notes are taken from the type (*R. E. D. Baker* 1475, K) and complete the original diagnosis.

2. This species is highly characterized by its colour, its spores with endosporal thickening and by its capitate cheilocystidia. This last feature excludes a synonymy with *A. venus* Murr. (Murrill, 1918) which has ordinary cystidia according to A. H. Smith (1940) who looked at the type.

3. Its systematic position is clearly among *Lanagaricus* where it is perhaps worth making it the typus of a subsection.

4. Elongated and capitate cheilocystidia occur but very rarely in *Agaricus*. I know only the present species in *Lanagaricus* and two species in *Conioagaricus* (see p. 246).

9. **Agaricus ficophilus** *Heinem.*, sp. nov.—Fig. 6; pl. 1/3, p. 248.

Pileus carnosus, umbonatus, croceo-brunneus, concentrice squamulosus. Stipes solidus, clavatus, pileo concolor, usque ad annulum squamulosus; annulus amplus, luteolus. Lamellae confertae, liberae, latiusculae, atro-brunneae. Caro albida; odor gratus. Sporae purpureo-brunneae, 5–6 (6·5) × 3·2–4·3 μ, ellipticae. Cheilocystidia 20–30 × 10–12 μ.

Pileus (2)5–13 cm. diam., fleshy, expanded with large central umbo, yellow brown, scaly with darker concentrically arranged squamules which are smaller near the centre; margin somewhat fissile. *Stem* 5–10 cm. × 4–11 mm., clavate, up to 23 mm. diam. beneath, solid, yellow brown, clothed below ring with darker recurved squamules; ring sheathing above, large, cream yellowish and furfuraceous at the upper side, ochraceous and ± scaly at the underside. *Flesh* whitish, ochraceous in the peripheric layer of the stem; strong fragrant odour when dried, somewhat of anise.

Exsiccatum: pileus, stem and flesh yellowish brown; gills dark brown; efflorescences none or few.

Spores reddish brown in water, rather dark brown in ammonia, 5–6(6·5) × 3·2–4·2 μ, ellipsoid or hardly oval; membrane rather thick; pore none. *Basidia* 4-spored. *Subhymenium* cellular. *Cheilocystidia* tufted, simple or septate, hyaline or brown, 20–30 × 10–12 μ. *Pileus surface* made of cylindrical hyphae, 3–7 μ diam.; scales formed of shorter, broader ± detersile cells, (10) 13–37 × 5–10 μ which are slightly narrowed at the septa; membrane thin, yellowish, nearly smooth; secondary septa frequent; contents brown. *Coating of stem* analogous, with longer cells.

Schaeffer microreaction (Aniline × HNO_3): negative.

Trinidad. Port of Spain, Botanic Garden, in clusters of 2–3 from a common base, among roots of *Ficus bengalensis*, 9.11.1949, *Dennis* 313 (holotype, K); Siparia, on the ground in forest, 3.11.1949, *Dennis* 279.

Remarks. This species is characterised by the dense scaly coating of both stem and pileus. It comes very near *A. rufolanosus* Heinem. & Gooss. (Heinemann, 1956) of the Congo, whose coating is more felty than scaly and whose spores present a very rudimentary apical pore. *A. praemagnus* Murr. (Murrill, 1918) is paler and has a fugacious ring and according to A. H. Smith (1940) who looked at the type, larger spores and smaller cheilocystidia. *A. fulviceps* Berk. (*fulvipes* Berk. in Saccardo, 1887) is smaller, more slender and

has subnavicular spores. There is also much similarity with the two following species.

10. **Agaricus rufoaurantiacus** *Heinem.*, sp. nov.—Fig. 7; pl. 1/4, p. 248.

Pileus carnosus, convexus, luteolus, squamulis rufo-aurantiacis praeditus, margine floccoso-appendiculatus. Stipes fistulosus, cylindraceus, sursum albus, deorsum pileo concolor squamulosusque; annulus amplus, albus, margine aurantiaco-floccosus. Lamellae confertiusculae, latiusculae, rotundatae, liberae, diu luteolae deinde brunneae. Sporae atrobrunneae, 4–5 × 2·9–3·8 μ, ellipticae. Cheilocystidia 13–23 × 8·5–14 μ.

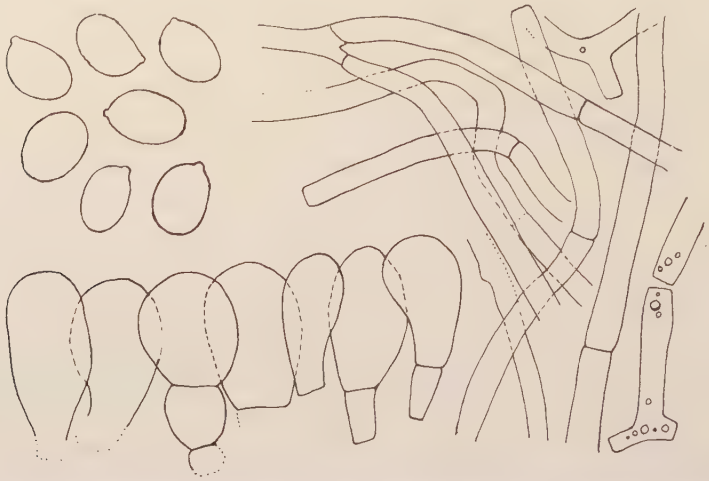

Fig. 7. *Agaricus rufoaurantiacus.*—Spores × 2000; cheilocystidia and hyphae of pileus coating × 1000 (holotype).

Pileus 2·5–7 cm. diam., fleshy, convex, yellowish with innate orange-rufous squamules which are ± concentrically arranged and more dense toward the bright rufous centre; margin floccose, appendiculate. *Stem* 8–10 cm. × 5–10 mm., cylindrical, narrowly hollow, scarcely thickened toward base, white above annulus, yellowish with innate orange-rufous squamules below the annulus, more coloured toward base; annulus large, membranaceous, white, floccose and orange coloured at its margin. *Gills* rather crowded, up to 5 mm. broad, rounded at both ends, somewhat remote from the stem, long remaining yellowish, then becoming chocolate. *Flesh* yellowish in the pileus with a rufous line above the gills, rufous in the stem, perhaps turning rufous when cut. *Spore-deposit* deep brown.

Exsiccatum: pileus, stem and flesh rather bright ochre; gills brown; efflorescences none or few.

Spores deep brown, 4–5 × 2·9–3·8 μ, ellipsoid; membranes rather thick; pore none. *Basidia* 4-spored. *Subhymenium* cellular. *Cheilocystidia* piriform or clavate, rarely septate near the base, 13–23 × 8·5–14 μ, hyaline with thin membrane. *Coating of pileus* with cylindrical very narrow hyphae, 3–4·5 μ diam., frequently containing orange coloured droplets.

Schaeffer microreaction: negative on exsiccatum, difficult to observe owing to the proper colour of the pileus.

Trinidad. River Estate, in clusters on the ground under bamboos, 27.10. 1949, *Dennis* 241 (holotype, K); Port of Spain, Botanic Garden, on a log, 11.11.1949, *Dennis* 328 (K).

Remarks. This species differs from the preceding one by the less individualised scales which are formed of much narrower hyphae. The other differences seem subject to variation. The collection 328 shows still smaller spores (4·4–5 × 2·9–3·3 μ) and narrower hyphae in the scales (2·3–4 μ diam.).

11. **Agaricus ochraceosquamulosus** *Heinem.*, sp. nov.—Fig. 8; pl. 1/5.

Pileus carnosulus, expansus, cremeo-ochraceus, minute squamulosus. Stipes cylindraceus, fistulosus, cremeo-ochraceus, infra annulum fibrillosus squamulosusque; annulus membranaceus, albus, fragilis. Lamellae confertiusculae, latae, roseo-brunneae, liberae, ad marginem acutiusculae. Caro in pileo alba, in stipite ochracea. Sporae purpureo-brunneae, 5·1–5·7 × 3·6–4 μ, ellipticae. Cheilocystidia 12–20 × 8–9 μ.

Fig. 8. *Agaricus ochraceosquamulosus.*—Spores × 2000; basidia and cheilocystidia × 1500; cells of scales of pileus × 1900 (holotype).

Pileus c. 6 cm. diam., rather fleshy, expanded, dry, ochraceous-cream dotted with minute rufous innate squamules, becoming ochraceous with age. *Stem* c. 5 cm. × 5 mm. cylindrical, narrowly hollow, ochraceous cream, beset below ring with white fibrils and ochraceous dots similar to those of the pileus, annulus membranaceus, white, narrow and fragile. *Gills* medium crowded, up to 7 mm. broad, light reddish brown, rounded and completely free at the stem, rather acute at the margin. *Flesh* white in the pileus, bright ochraceous in the stem.

Exsiccatum: pileus ochraceous orange; stem deep brown, reddish near the base; gills nearly black; efflorescences very small, few on stem and gills.

Spores deep reddish brown in water, more bistre in ammonia, 5·1–5·7 × 3·6–4 μ, ellipsoid; membranes rather thick; pore none. *Basidia* 4-spored, shortly piriform or clavate, 15–24 × 7·5–9 μ. *Cheilocystidia* inconspicuous on dried material, probably shortly lanceolate, c. 12–20 × 8–9 μ, hyaline. *Subhymenium* cellular. *Coating of pileus* made of loosely interwoven cylindrical hyphae of 4–12 μ diam.; scales composed of ± fasciculated hyphae with shorter, more coloured and ± detersile cells of 15–25 × 3·5–9 μ; orange coloured granules or droplets in certain cells.

Schaeffer microreaction (Aniline × HNO_3): bright orange.

Trinidad. Port of Spain, Botanic Garden, 2 sporophores growing together on *Ficus* trunk about 30 cm. above ground, 9.11.1949, *Dennis* 314 (holotype, K).

Remark. This species comes very near *A. laeticolor* Heinem. & Gooss. (Heinemann, 1956) which is smaller, brighter coloured with less individualised squamules, solid stem and more conspicuous cystidia. These two species may be entered in a new section* forming a linkage between the sect. *Arvenses* of the typical subgenus and subgen. *Lanagaricus*.

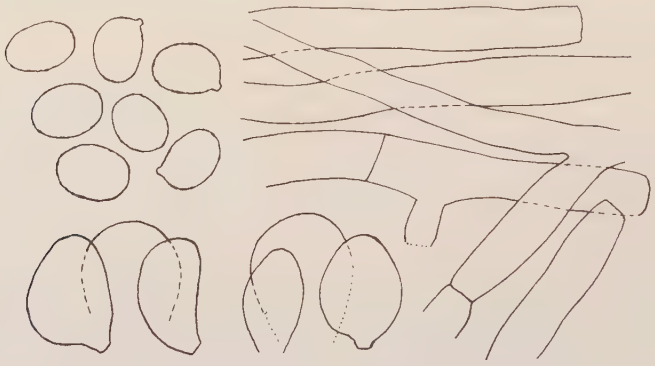

Fig. 9. *Agaricus bambusophilus*.—Spores × 2000; cheilocystidia and cells of pileus coating × 1000 (holotype).

Subgen. CONIOAGARICUS Heinem.

The species of Trinidad are not easily referred to the existing system of sections without emendation, which I hope to carry out later on.

12. **Agaricus bambusophilus** *Heinem.*, sp. nov.—Fig. 9; pl. 1/6, p. 248.

Pileus submembranaceus, late conicus, roseo-brunneolus, medio squamulosus, margine striatulus. Stipes cylindraceus, cavus, albus; annulus fragilis, albus. Lamellae subdistantes, latiusculae, griseo-nigrae. Caro alba. Sporae atro-brunneae, 4–4·8 × 3–3·3 μ, ellipsoideae. Cheilocystidia 10–16(22) × 7–10·5 μ.

*__Laeticolores__ *Heinem.*, sect. nov. subgen. *Lanagarici*. Laete colorati. Reactio Schaefferi (Aniline × HNO_3) positiva. Ad sect. *Arvenses* (subgen. *Agaricus*) vergens. Typus: *Agaricus laeticolor* Heinem. & Gooss., *loc. cit.* 98.

Pileus c. 4 cm. diam., thin, submembranaceous, widely conical with flattened apex, brownish with a rosy hue (M & P: 6 F 8), dotted chiefly in the centre with darker, triangular, innate squamules; margin faintly striate. *Stem* c. 4·5 × 3 mm., cylindrical, widely tubular, white; annulus white, narrow, placed near the apex. *Gills* slightly remote from stem, 3 mm. broad blackish. Flesh white.

Spores deep brown, 4–4·8 × 3–3·3 μ, ellipsoid; membranes thick; pore none. *Basidia* 4-spored. *Cheilocystidia* hyaline, widely lanceolate, 10 16(22) × 7–10·5 μ. *Pileus coating* made of cylindrical hyphae, 4–7 μ wide, with smooth, or faintly verrucose, thin and hyaline membrane and purplish brown sap.

Schaeffer microreaction: (Aniline × HNO_3): negative.

Trinidad. St. Augustine, Monastery Hill, one sporophore on the ground, Nov. 1949, *Dennis* 332 (holotype, K).

Remarks. 1. The specimen is in a very poor state, hence the somewhat incomplete description.

2. This species seems close to *A. lateriticolor* Heinem. (Heinemann, 1956) and *A. yucatanensis* Ell. & Ev. (Millspaugh, 1896), the first having a coloured stem and paler somewhat narrower spores, the second larger spores, a median ring and narrower gills.

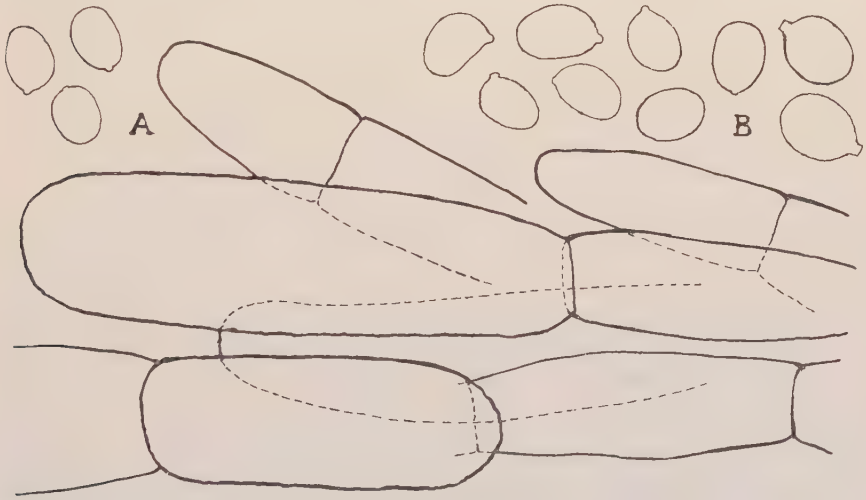

Fig. 10. *Agaricus dennisii*.—A, Spores × 2000; cells of pileus coating × 1000 (holotype). B, spores with, at the right side, 2 hypertrophied ones × 2000 (*Dennis* 144A).

13. **Agaricus dennisii** *Heinem.*, sp. nov.—Fig. 10; pl. 1/7, p. 248.

Pileus tenuis, campanulatus deinde convexus, anguste umbonatus, sericeo-fibrillosus, pallidus deinde roseo-brunneolus, medio brunneus, margine striatus, velo appendiculatus. Stipes cylindraceus, fistulosus, bulbillosus, albidus deinde roseolus; annulus ascendens, albus. Caro pilei roseola, stipitis rubro-brunnea. Sporae atro-brunneae, 3.8–4·5 × 2·7–3·3(3·6) μ, breviter ellipsoideae. Cheilocystidia nulla.

Pileus 3–4 cm. diam., submembranaceous, campanulate then widely convex with the centre umbonate, silky-fibrillose, first pale then light

pinkish brown with darker umbo; margin even, then striate up to a length of 6 mm., appendiculate and denticulate with the white veil. Old pilei may exude on their surface drops of reddish liquid. *Stem* 4–5 cm. × 2–3 mm., cylindrical, thickened up to 5 mm. toward the base, narrowly hollow, smooth, whitish then pinkish; annulus white, membranaceous, cupulate. *Gills* up to 2·5 mm. broad, slightly remote from stem, rounded at both ends, greyish brown. *Flesh* dull pinkish in the pileus, reddish brown in the stem chiefly above.

Exsiccatum: colours not modified; efflorescences few but large, chiefly upon the gills.

Spores deep brown, 3·8–4·5 × 2·7–3·3(3·6) μ, shortly ellipsoid; membranes thick; pore none. *Basidia* 4-spored. *Cheilocystidia* none; edge fertile. *Subhymenium* cellular. *Pileus coating* made of cylindrical hyphae, 10–20μ diam., slightly narrowed at the septa; secondary septa fairly frequent; membrane rather thick; purple brown sap on fresh specimens.

Schaeffer microreaction: (Aniline × HNO_3): negative.

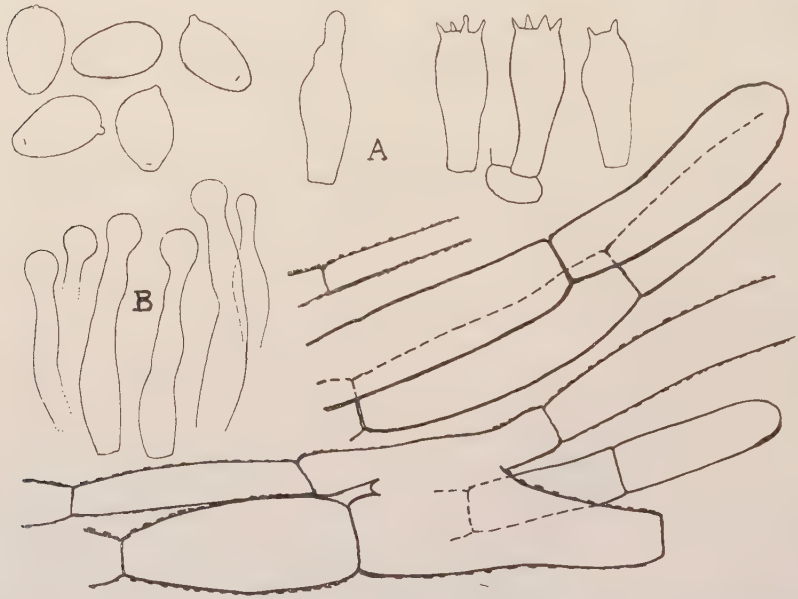

Fig. 11. *Agaricus cephalocystis*.—Spores × 2000; one pleurocystidium (A), cheilocystidia (B), basidia and hyphae of pileus coating × 1000 (holotype).

Trinidad. St. Augustine, on the ground among fallen leaves and twigs of bamboo, 7.10.1949, *Dennis* 144 (holotype, K): found again at the same place, 20.10.1949 (144A) and 10.11.1949 (144C).

Remark. The absence of cheilocystidia was verified by the collector on young and fresh sporophores.

14. **Agaricus cephalocystis** *Heinem.*, sp. nov.—Fig. 11; pl. 1/8, p. 248.

Pileus submembranaceus, expansus, umbonatus, fibrilloso-squamulosus, roseo-brunneolus. Stipes subcylindraceus, fistulosus, roseolus; annulus fragilis, albus. Lamellae latiusculae, rotundatae, liberae, roseolae deinde

brunneolae. Caro alba. Sporae brunneae, 5·3–6·5 × 3·3–3·8 μ, ovatae; endosporium truncatum. Cheilocystidia elongata, capitata, 25–35 × 4–5·5 μ, apice 3–5 μ diam.

Pileus submembranaceous, c. 2·5 cm. diam., expanded with a rounded brown umbo, fibrilloso-squamulose, with pinkish brown fibrils on paler ground. *Stem* c. 4 cm. × 2 mm., cylindrical, slightly clavate, thickened up to 4 mm. at the base, narrowly hollow, pinkish, more coloured toward the base; annulus whitish, membranaceous, fragile. *Gills* up to 2·5 mm. broad, rounded at both ends, free, light pinkish brown, not darkening much. *Flesh* white.

Exsiccatum: deep brown (not well preserved).

Spores brownish, yellow-brown in Melzer, 5·3–6·5 × 3·3–3·8 μ, ovoid, broader towards the base, with the apex somewhat stretched and faintly truncate; membranes rather thin, the endosporium being truncate at the apex thus simulating a rudimentary pore. *Basidia* 2- or more often 4-spored, 15–19 × 6–7·5 μ. *Cheilocystidia* numerous, 25–35 × 4–5·5 μ, elongated, slightly ventricose, with apical knob 3–5 μ wide. *Pleurocystidia* scarce (one seen near the edge: see drawing!). *Subhymenium* cellular. *Coating of pileus* made of cylindrical hyphae, 5–15 μ wide, slightly narrowed at the septa, with purplish brown, roughly incrusted membrane. *Stem surface*, near the summit, bearing a few hairs analogous to the cheilocystidia.

Schaeffer microreaction: (Aniline × HNO_3): negative. *Ammonia*: context becoming bistre.

Trinidad. St. Augustine, one sporophore on the ground in bamboo plantation, 7.10.1949, *Dennis* 147 (holotype, K).

Remarks. 1. The sole sporophore is not in a very good state.

2. This species comes very near *A. vinaceo-umbrinus* Smith (1944) a specimen of which, kindly communicated by Dr. A. H. Smith, shows the same fundamental characters with only quantitative differences: cheilocystidia somewhat longer, hence more filamentous, but with the apical knob evenly well marked; spores 6·2–7·3 × 4·8–5·4 μ, larger, broader, more rounded, the apex being but exceptionally very slightly stretched, the thickening of the endosporium less marked and more flattened though evident on ripe spores; same reaction with KOH or ammonia; coating of pileus with hyphae nearly smooth. The macroscopic differences cannot be pointed out because *A. vinaceo-umbrinus* has been described on dried material, the colours in the fresh state remaining ignored.

Except for the thickening of the endosporium which can easily be overlooked, the above mentioned characters are well indicated in the excellent description of A. H. Smith.

Acknowledgments

I am deeply indebted to Dr. R. W. G. Dennis who gave me the opportunity of studying his material of *Agaricus* from Trinidad and for correcting my English.

Further I thank the Director of the Royal Botanic Gardens, Kew, for the hospitality in this Bulletin as well as for lending material preserved in the Kew Herbarium. My thanks are also due to the Director of the Institute Spegazzini, La Plata and to Dr. A. H. Smith for the loan of material.

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Explanation of Plate 1.

1. *Agaricus porosporus* (a: holotype; b: *Dennis* 1081, Venezuela).—2. *A. purpurellus* (*Dennis* 423).—3. *A. ficophilus* (holotype).—4. *A. rufoaurantiacus* (holotype).—5. *A. ochraceosquamulosus* (holotype).—6. *A. bambusophilus* (holotype).—7. *A. dennisii* (holotype).—8. *A. cephalocystis* (holotype).—Drawings by R. W. G. Dennis, about half natural size.

An overlooked synonym of Glossonema Decne. (Asclepiadaceae).—A synonym, established fifty years ago and subsequently overlooked, was omitted from my revision of *Glossonema* Decne. (Kew Bull. 10: 613–619 (1956)). Pax (in Engl., Bot. Jahrb. 19: 80 (1894)) described a plant collected by Hildebrandt in Somaliland as a new monotypic genus of *Euphorbiaceae*, namely *Gilgia candida*. The specimen had only unopened flowers, and Pax grossly misinterpreted their structure on dissection. He thought they were male flowers, and described them as monoecious or dioecious; the coronal lobes, he thought, were interstaminal glands, whilst he described their incurved filiform apical appendages as hyaline filaments. The latter were, apparently, just touching the real anther-appendages, and these were described as extrorse anthers. The gynostegium he described as an aborted gynoecium.

The exclusion of *Gilgia* from *Euphorbiaceae*, and its identity with *Glossonema revoilii* Franch. was first pointed out by Brown, Hutchinson and Prain in the 'Flora of Tropical Africa' 6(1): 441 (1911) and has been repeated by Lemée in his Dictionary. I have to thank my colleague Mr. H. K. Airy Shaw for drawing my attention to it.

A. A. Bullock

PLATE 1

For explanation see opposite]

[*To face page* 248

Contributions to the Flora of Thailand: LV*

E. C. Barnett (Aberdeen University)

GESNERIACEAE

Oreocharis hirsuta *Barnett*, sp. nov. *O. aureae* Dunn affinis, foliis minoribus pro rata latioribus nervis lateralibus paucioribus, pilis petiolorum magis patentibus, bracteis angustioribus haud serratis, segmentis calycinis angustioribus atque magis hirsutis, corolla ore minus angustata lobis plus minusve aequalibus differt.

Herb with leaves crowded at the apex of a short rootstock. Leaves elliptic or ovate, acute, base cuneate or subrounded or occasionally slightly cordate, bi-serrate, 5–8·5 cm. long, 2·7–4·6 cm. wide, upper surface greyish-green, lower paler and more tawny, when young densely hirsute with tawny multicellular hairs on both surfaces, older with hairs scattered except on the hirsute nerves on the lower surface; lateral nerves 6–7 pairs, prominent or subprominent below, somewhat faint above; petioles 1·2–6·5 cm. long, tawny hirsute. Peduncles axillary, tawny hirsute, 13·5–18 cm. long, branching to form a cymose inflorescence with 6–7 flowers; bracts at apex of peduncle narrow, linear acute, entire, densely tawny hirsute below, almost glabrous above, c. 8 mm. long, 1·5 mm. wide at base, bracteoles similar but smaller; pedicels slender c. 1·5 cm. long, hirsute, some of the hairs glandular. Calyx 5-partite to base, segments narrow acute, c. 0·5 cm. long, hirsute. Corolla pubescent with glandular hairs, c. 2 cm. long, widening gradually from c. 2 mm. wide at base to 4 mm. wide at base of 5-lobed limb, lobes, more or less equal, the two posterior slightly longer, c. 5 mm. deep. 2·5 mm. wide. Stamens 4 didynamous, anthers not coherent, glabrous, oval c. 2 mm. long, filaments hirsute, those of the shorter pair arising c. 7 mm. from base of corolla, c. 3 mm. long, those of the longer pair c. 8·5 mm. from base c. 5 mm. long. Pistil total length c. 9 mm., ovary slightly stalked, glabrous, c. 5·5 mm. long, style and peltate stigma c. 1·5 mm. Disc c. 1 mm. deep. Capsules straight, shortly stalked, c. 4·5 cm. long, glabrous.

Thailand. Payap. Chiengmai, Doi Nang Ka, 11 Nov. 1930, *Put* 3428 (K, holotype, ABD, BKF, isotypes):—flowers yellow.

Oreocharis obovata *Barnett*, sp. nov. *O. benthami* C. B. Cl. simulans, sed indumento magis patente haud vellereo, inflorescentia magis pauciflora, floribus multo majoribus differt.

Low herb with the leaves crowded at the apex of a stout root-stock. Leaves obovate or oblanceolate, apex rounded, base narrowed, sub-rounded or cuneate, 9·2–14·4 cm. long, 3·8–7 cm. wide, lateral nerves 8–11 pairs, prominent below, obscure above, both surfaces glabrous except for the tawny hirsute nerves below and the ciliate entire margins; petioles stoutish, 1·5–2·5 cm. long, hirsute, hairs somewhat matted. Peduncles axillary, hirsute to 8·5 cm. long. Flowers 2–3 on very short pedicels. Calyx 5-partite to base, segments long acuminate, hirsute c. 1·8 cm. long, c. 2·5 mm. wide at

*Continued from Bull. Misc. Inf. Kew 1941: 21 (1941).

base. Corolla trumpet-shaped, with scattered hairs, c. 4·6 cm. long, c. 7 mm. wide at base, gradually widening to the oblique 5-lobed limb, the centre anterior lobe narrower and slightly longer than the other two, c. 4 mm. wide, c. 9 mm. long, the others c. 7 mm. wide and long. Stamens 4 didynamous, anthers not coherent, glabrous, filaments arising c. 1 cm. from base of corolla tube, flattened and glabrous, those of the shorter pair c. 2 cm. long, the longer c. 2·3 cm. long. Pistil c. 2·4–2·5 cm. long, pubescent, ovary gradually tapering to style (stigma not clear). Disc distinctly lobed. Fruits unknown.

Thailand. Pattani. Bukit Nasi, Toh Moh, c. 550 m., 16 Apr. 1931, *Lakshnakara* 646 (K, holotype, ABD, BKF, isotypes):—low herb; flowers red.

Didymocarpus biserratus *Barnett*, sp. nov. *D. kerrii* Craib simulans, foliis haud aureoglandulosis, floribus multo majoribus, staminum filamentis longioribus antheris corollae fauces haud attingentibus differt; praeterea *D. wattianum* Craib simulans ob filamenta gracilia e parte corollae tubi ampliata exorientia necnon antheras barbatas corollae fauces haud attingentes, sed floribus aliquantum minoribus, lobis calycinis inaequalibus longioribus, pistillo glabro glandulis sessilibus haud praedito, denique foliis pro rata latioribus differt.

Stem c. 24 cm. long, hirsute. Leaves opposite, the pairs unequal, chartaceous, widely ovate, obtuse, base cordate, c. 3 cm. long and wide to 8·3 cm. long and wide, margin biserrate, upper surface dark brownish-green, densely whitish pilose, lower almost glabrous except for the hirsute mid-rib and lateral nerves, lateral nerves up to 6 pairs, faint above, prominent below; petioles hirsute up to c. 11 cm. long. Peduncles axillary up to 8 cm. long, glabrous; bracts wide hemispheric, glabrous, cymes few-flowered. Calyx glabrous, c. 1·3 cm. deep, lobes unequal, shortly triangular, the 2 anterior c. 2·5 mm. deep, 3 mm. wide at base, the 3 posterior c. 1 mm. deep, c. 2 mm. wide at base. Corolla c. 4 cm. long, limb oblique, anterior lip longer than posterior. Stamens 2, filaments slender arising c. 2 cm. from base of corolla, anthers coherent, white, bearded, staminodes filiform. Pistil glabrous, stipe c. 9 mm. long, ovary c. 2 cm. long, style c. 3 mm., stigma peltate, papillose. Disc c. 2 mm. deep.

Thailand. Udawn. Loie, Phu Krading, on rocks in Oak forest, c. 1300 m., 20 Aug. 1954, *Smitinand* 1870 (E, holotype):—succulent pendulous herb; flowers dark purple.

Didymocarpus megaphyllus *Barnett*, sp. nov. *D. kerrii* Craib atque *D. purpureo-picto* Craib affinis, ab illo foliis multo majoribus haud pilosis haud biserratis nervis pilis rigidis squamiformibus carentibus, inflorescentiis axillaribus; ab hoc foliis majoribus, nervis lateralibus numerosioribus, glandulis aureis paucissimis sparsis minutis inconspicuis differt.

Herb 0·5 mm. high (fide Kerr). Stem somewhat ribbed, glabrous with crimson blotches. Leaves opposite, the pairs often unequal, ovate or oval, acuminate, base rounded or narrowed usually very unequal, the one side somewhat rounded, the other cuneate, 8·5–23·5 cm. long, 4·5–12·3 cm. wide, thin papery, upper surface dull greenish, lower pallid, the upper with scattered white adpressed hairs, the lower glabrous, both with very in-

conspicuous scattered gold glands, very young leaves pubescent on both surfaces, more densely above, lateral nerves 10–11 pairs, subprominent above, prominent below, curving upwards short of the serrate margin; petioles slender, 2·2–8 cm. long, glabrous. Inflorescences dichasial, peduncles axillary, slender, glabrous, to c. 5 cm. long; bracts at apex of peduncle 2, opposite very wide, almost hemispheric, overlapping each other, c. 4 mm. long, c. 5 mm. wide, glabrous. Calyx glabrous, c. 0·5 cm. deep, widening from c. 1·5 mm. at base to c. 5 mm. at mouth, 5-lobed to about half depth, lobes wide triangular, narrowing abruptly to blunt tips. Corolla, with a few scattered hairs, up to nearly 4 cm. long, tube c. 3 mm. wide at base, narrow for c. 1·7 cm., then widening abruptly especially on anterior side to c. 1·7 cm. across limb, lobes rounded c. 3 mm. deep, c. 5 mm. wide, more or less equal, mouth slightly oblique. Stamens 2, anthers cohering, pubescent, filaments arising from widening part of tube, 8–9 mm. long, staminodes 2, slender c. 2·5 mm. long, with tiny slightly pubescent caps. Pistil total length c. 2·8 cm., glabrous, style short c. 2 mm., stigma peltate, concave, papillose. Disc cup-shaped c. 1·5 mm. deep.

Thailand. Surat. Ban Kawp, on rock in evergreen forest, c. 100 m., 8 Aug. 1927, *Kerr* 13215 (K, holotype, ABD, BKF, isotypes):—flowers crimson.

Didymocarpus ovatus *Barnett*, sp. nov. *D. bicolori* Craib proximus, caule longiore hirsuto sed pilis multicellularibus haud glanduliferis, foliis majoribus acutis vel acuminatis nec obtusis, limbo corollae haud bicolori, antheris barbatis, ovario glabro differt.

Herb; stem slender, hirsute. Leaves opposite, ovate, broadly ovate or oval, apex acute or acuminate, base rounded or cuneate, unequal, 7–15 cm. long, 3·5 7·6 cm. wide, both surfaces pubescent, the nerves below hirsute, margin serrate-crenate or biserrate, ciliate, lateral nerves c. 8 pairs; petioles up to c. 3 cm. long, caniculate above, hirsute. Peduncles axillary, 6–9 cm. long, with scattered spreading gland-tipped hairs, becoming almost glabrous; bracts widely ovate c. 4 mm. long, 5 mm. wide, glabrous, bracteoles similar but slightly smaller, inflorescences dichasial, pedicels with gland hairs as peduncles. Sepals free, linear-lanceolate or oblanceolate, apices rounded apiculate, somewhat boat-shaped, glabrous, the 2 anterior slightly longer than the 3 posterior c. 4·5 mm. long, 2 mm. wide. Corolla glabrous, tube narrow c. 1·5 cm. long, 2 mm. wide at base, widening very slightly to the 2-lipped, 5-lobed limb, limb c. 8 mm. wide, lobes shallow, rounded, posterior lip 2-lobed, erect, anterior spreading, 3-lobed. Stamens 2, filaments arising c. 1 cm. from base of corolla, anthers coherent, oval, bearded. Pistil c. 1·8 cm. long, ovary stipitate, c. 1 cm. long, glabrous, style slender, c. 7 mm. long, stigma roundish-capitate. Disc cup-shaped c. 1·5 mm. deep.

Thailand. Surat. Kao Nawng, on rocks in evergreen forest, c. 900–1200 m., 10 Aug. 1927, *Kerr* 13259 (K, holotype, ABD, BKF, isotypes):—corolla tube white, lobes crimson, bracts white.

Didymocarpus venosus *Barnett*, sp. nov., e sectione *Didymantho* ob inflorescentiam pseudo-racemosam, corollam prominenter venosam labio anteriore longo ac horizontaliter patente, calycis persistentis segmenta sub fructu recurva, capsulas breves pubescentes stipitatas notabilis.

Small herbs; stems slender, slightly woody, pubescent. Leaves opposite, the pairs sometimes unequal, ovate, more or less acute, base rounded, 2·5–5·1 cm. long, 1·5–4 cm. wide, both surfaces pubescent more densely so below; lateral nerves 7–12 pairs sub-prominent above, midrib flat nerves subprominent and somewhat hirsute below; petioles long, slender, up to c. 3·5 cm. long, hirsute. Inflorescence pseudoracemose; peduncles axillary, slender up to c. 5 cm. long, bracts slender, c. 3 mm. long, hirsute, some of the hairs gland-tipped; pedicels hirsute as peduncles to 8 mm. long. Calyx 5-partite to base, segments lanceolate, acute or sub-acute, c. 3–3·5 mm. long hirsute; corolla with a few scattered hairs, some gland-tipped, tube narrow c. 2 mm. wide at base, straight for c. 5 mm. then widening abruptly to the very oblique 5-lobed limb, anterior lip horizontal, considerably longer than the more erect posterior lip, lobes widely rounded c. 6–7 mm. wide and deep, total length of corolla to tip of anterior lip c. 2·5 cm., limb pale mauve, throat deep purple, prominent purple veins of tube diverging on limb. Stamens 2, filaments arising c. 6 mm. from base of corolla, i.e. in mouth of flower, c. 2 mm. long, somewhat thick, curving and narrowing towards union with anthers, anthers cohering, lobes divergent, staminodes 2. Ovary shortly stipitate, c. 4 mm. long, pubescent, style short, stigma well below anthers, sub-peltate, very slightly notched. Disc shallow, c. 0·25 mm. deep. Capsules stipitate, c. 1·5 cm. long, pubescent, persistent calyx lobes recurved; seeds very small, apiculate, less than 0·5 mm. long.

Thailand. Rachaburi. Ratburi, young plants collected on limestone rocks and cultivated in Bangkok, 25 Oct. 1924, *Kerr* 9341 (K, holotype).

Paraboea glanduliflora *Barnett*, sp. nov., a ceteris speciebus siamensibus habitu caulescente, floribus campanulatis neque tubo brevi limbo patente praeditis differt; *P. cordatae* Ridl. ex descriptione proxima, sed foliis nec acuminatis nec undique tomentosis, petiolis longioribus, pedunculis nisi basin versus glabris, secundariis pedicellisque pilis glanduliferis indutis differt.

Stem thickish, woody c. 0·5 cm. diameter, tawny tomentose, becoming glabrous towards the base. Leaves opposite, pairs unequal, oval or obovate, apex sub-acute, base narrowed, decurrent on petiole. c. 12·5–15·5 cm. long, to c. 8·5 cm. wide, upper surface very dark greenish, almost black with scattered short hairs, lower pale brownish, glabrous except for the tawny tomentose lateral nerves and distinct vein network, margin serrate-dentate, ciliate; lateral nerves 11–12 pairs, prominent below; petioles up to c. 7·5 cm. long, slightly winged, amplexicaul, with scattered remains of tawny tomentum. Inflorescence dichasial; peduncles axillary up to c. 17·5 cm. long, glabrous except for scattered white pubescence towards the base; bracts widely ovate; secondary peduncles and pedicels with spreading gland hairs. Calyx 5-partite to base, segments linear c. 4·5 cm. long, 1 mm. wide, apices rounded, glandular towards the base. Corolla campanulate, c. 1 cm. long (in bud), lobes rounded, equal c. 4 mm. wide and deep. Stamens 2, filaments arising from base of corolla, thick, straight for c. 3 mm. then with S-shaped twist, glandular on the S-bend, anthers coherent, large, c. 4 mm. long, 1·5 mm. wide, glabrous, pale with dark patch at union with filaments. Ovary glabrous, c. 0·5 cm. long, style slightly longer, stigma very small, papillose.

THAILAND. PAYAP. Chiengmai, Doi Chiengdao, common on rocky slope, c. 2000 m., 16 July 1958, *Smitinand* 4728 (*R.F.D.* 17842) (E, holotype):—succulent herb; flowers pinkish-purple.

Chirita fulva *Barnett*, sp. nov.; *C. integram* Barnett habitu simulans, sed statura multo breviore, foliis crenato-serratis nec integris, floribus multo minoribus albis neque purpureis, calyce usque ad basin quinquepartito lobis longe acuminatis subtiliter acutatis nec aliquantum rotundatis differt.

Acaulescent herb; rootstock short, densely tawny pilose with slender multi-cellular hairs. Leaves crowded, oval acute or sub-acute, narrowed to the often unequal base, 4·8–8 cm. long, 2–4 cm. wide, papery, tawny pilose when young, later with scattered whitish hairs on both surfaces; lateral nerves more or less obscure above, distinct below and tawny pilose, c. 6–8 pairs, margin crenate-serrate; petioles tawny pilose, 2–5 cm. long. Peduncles axillary, tawny pilose, up to c. 2 cm. long, single-flowered or up to 8-flowers in dichotomous cymes; bracts linear c. 0·5 cm. long, hirsute. Calyx 5-partite to base, segments slender acuminate finely pointed, hirsute, more or less equal, 0·5–0·7 cm. long. Corolla puberulous, to c. 1 cm. long, 1·5 mm. wide at base, somewhat abruptly widening c. 4 mm. from base, especially on anterior side, to c. 0·8 cm. at mouth, lobes rounded more or less equal, 0·25 cm. deep, 0·3 cm. wide, mouth somewhat oblique. Stamens 2, filaments becoming free c. 3 mm. from base of corolla, c. 5 mm. long, slender, anthers in mouth of corolla, reniform c. 1·5 mm. long, just over 0·5 mm. wide, glabrous. Ovary 2 mm. long, 1 mm. wide, pubescent, style and stigma c. 1 cm. long, stigma flat, emarginate. Young fruit c. 0·5 cm. long, included in the calyx, conical, pubescent, style long 0·6 cm. pubescent.

THAILAND. SURAT. Ban Kawp Kep, on limestone rocks, c. 50 m., 5 Aug. 1927, *Kerr* 13171 (K, holotype):—flowers white.

Chirita integra *Barnett*, sp. nov. *C. brevipedi* C. B. Cl. aliquantum affinis, sed foliis minoribus integris neque serratis, pedunculis longioribus, antheris glabris differt.

Acaulescent herb. Young leaves small ovate-lanceolate or ovate, almost sessile, tawny pilose; mature leaves thin papery, ovate or oval, apex acute or acuminate, base more or less rounded or cuneate, 7·5–18·5 cm. long, 4·5–9 cm. wide, both surfaces with scattered white hairs, the nerves below somewhat hirsute, with long tawny hairs, margins entire, ciliate, lateral nerves arched, somewhat obscure above, distinct below c. 7 pairs; petioles up to 10·5 cm. long, hirsute. Peduncles 3·4–7 cm. long, hirsute, pedicels 1–4, arising together from apex of peduncle, slender, hirsute, 1–1·6 cm. long; bracts at apex of peduncle 2 tiny linear acute c. 3 mm. long. Calyx c. 1·5 cm. deep, hirsute without, glabrous within, lobed to c. half depth, lobes c. 1·5–2 mm. wide at base narrowing gradually to obtuse or slightly rounded tip. Corolla, with scattered hairs, funnel-shaped, c. 2·5 mm. wide at base, widening gradually to the 5-lobed slightly oblique limb, up to c. 4·5 cm. long, c. 2 cm. wide across limb, lobes widely rounded c. 0·9 cm. wide, 0·7 cm. deep. Stamens 2, filaments arising c. 1 cm. from base of corolla, widening to c. 2 mm. at middle then narrowing to junction with anthers, united with anthers along their whole length of c. 2 mm. and ending in an acute tip, anthers cohering by their inner faces; staminodes 2 with slender fila-

ments and minute coherent immature anthers. Pistil total length c. 2·3 cm., ovary c. 6 mm., pilose with overlapping white hairs, tapering gradually to the long style c. 1·5 cm. long, pilose at the base but becoming glabrous towards the tip, stigma flattened, spathulate c. 2·5 mm. long 2 mm. wide, slightly 2-lobed, papillose.

THAILAND. PUKET. Panom Bencha, Krabi 700–1000 m. on rocks in evergreen forest, 26 Mar. 1930, *Kerr* 18684 (K, holotype, ABD, BKF, isotypes):—corolla purple, lobes white, two yellow streaks in throat.

Chirita rotundata *Barnett*, sp. nov. *C. anachoretam* Hance simulans sed foliis pro rata latioribus apice plerumque rotundatis nec acutis, glabris vel pilis paucis in pagina superiore sparsis, nervis lateralibus paucioribus, marginibus integris, floribus majoribus differt.

Small plants with slender, reddish ribbed stems up to c. 15 cm. long arising from rootstock. Leaves towards the apex of the stem, opposite, the pairs often unequal, ovate, obovate, sometimes almost rotund, occasionally lanceolate, mature 4–6·8 cm. long, 1·8–4 cm. wide, margin entire, sparsely ciliate, very thin papery, both surfaces glabrous or with a few scattered hairs on the upper surface, lateral nerves usually 6–8 pairs, occasionally 4–5; petioles slender usually c. 1 cm. but may be up to 2 cm. long. Peduncles axillary, very slender, most often single-flowered but sometimes bearing 2 or 3 flowers on very short slender pedicels; bracts at base of pedicels wide ovate. Flowers comparatively large up to nearly 5·5 cm. long. Calyx thin, glabrous up to 1·9 cm. long, 5-fid to half its length, lobes tapering to long fine points. Corolla funnel-shaped c. 3 mm. wide at base, widening gradually to the oblique limb, lobes 5, rounded, the three anterior longer than the 2 posterior, c. 5 mm. deep, 6 mm. wide. Stamens 2, filaments arising c. 8 mm. from base of corolla, nearly 1 cm. long with a few scattered hairs towards the base becoming almost pilose at union with the anthers, anthers oval c. 2·5 mm. long, glabrous, coherent. Pistil c. 2·3 cm. long, glabrous, ovary indistinguishable from style, stigma flattened decidedly bi-lobed, almost reaching the mouth of the corolla tube, well beyond the anthers. Disc a very shallow cup c. 0·5 mm. deep.

THAILAND. PAYAP. Me Chem, Chiengmai, on rocks near stream in deciduous forest, c. 700 m., 11 July 1922, *Kerr* 6274 (K, holotype, ABD, BKF, isotype):—corolla lobes mauve with yellow patch in throat.

Chirita trisepala *Barnett*, sp. nov. *C. brevipedem* C. B. Cl. atque *C. integram* Barnett habitu forma foliorum necnon floribus simulans, sed ab ambabus calyce trilobo recedit.

Acaulescent herb; young shoots and leaves tawny hirsute with long multicellular overlapping hairs, later becoming almost glabrous. Leaves thin papery, ovate, acute, base more or less rounded, margin crenate-serrate, to c. 17 cm. long, c. 9 cm. wide, both surfaces with scattered hairs, more densely hairy on the nerves below, laterally nerves usually 7 pairs but occasionally 9 pairs; petioles to 10 cm. long, puberulous. Peduncles up to 20 cm. long, puberulous; bracts at apices of peduncles ovate-triangular, subcordate at base, distinctly serrate, with scattered hairs on both surfaces, more densely below and on margins, bracteoles as bracts but smaller;

pedicels pseudo-umbellate, to c. 1 cm. long, with scattered hairs. Calyx somewhat oblique, c. 1·5–1·7 cm. deep, 3-lobed to c. half depth, the posterior lobe shallowly 3-lobed, the cup wider than corolla tube, texture thin, almost glabrous but with a few scattered hairs. Corolla to over 5 cm. long, trumpet-shaped, gradually widening from base to 2–3 cm. at mouth, anterior side slightly longer than posterior, lobes rounded, slightly puberulous without and within. Stamens 2, filaments arising c. 2 cm. from base of corolla, widening almost at once and narrowing near union with anthers, c. 1·2 cm. long, c. 1 mm. wide, anthers with lobes vertically one above the other, coherent, c. 3 mm. long. Pistil, total length c. 3·5 cm., pubescent, ovary c. 7 mm., style long c. 2·8 cm., stigma very slightly widened, flat, becoming shallowly 2-lobed. Disc c. 1·5 mm. deep. 5-lobed. Capsule not extending much beyond the persistent calyx, c. 1·8 cm. long, 3 mm. wide.

Thailand. Chantaburi. Chantabun, Kao Sabap, on rocks, 6 July 1927, *Put* 905 (K, holotype, ABD, BKF, isotypes).

Boea glabriflora *Barnett*, sp. nov. *B. reticulatam* Barnett habitu simulans, sed foliis minus dense tomentosis tomento multo pallidiore, nervis transversis haud prominentibus, inflorescentia glabra differt.

Herb with rootstock up to c. 7 cm. long. Leaves crowded at apex of rootstock, chartaceous pale greyish-green above, pale tawny below, upper surface with scattered short white hairs, lower felted with long fine hairs more tawny on lateral nerves, widely oval or ovate, apex rounded, base rounded or cuneate, unequal, 4·5–8 cm. long, 3·2–5 cm. wide, margin crenate, lateral nerves 5–6 pairs prominent below, transverse veins indistinct; petioles 3·3–7 cm. long, with closely matted pale tawny hairs, bases amplexicaul. Inflorescences axillary, dichasial; peduncles slender glabrous up to 30 cm. long, bracts at apices 2 slender c. 2·5 mm. long, glabrous; pedicels slender up to c. 2 cm. long, glabrous. Calyx 5-partite to base, lobes linear obtuse, c. 2·5–3 mm. long, glabrous persistent. Corolla (poor in specimen) under 0·5 cm. long, c. 1·2 cm. wide in open flower, 5-lobed to c. half depth. Stamens 2, filaments arising from base of corolla, c. 2 mm. long, flat, anthers large, oval c. 3 mm. long 1·5 mm. wide, somewhat pointed at ends and constricted in middle, coherent by anterior edges, filaments attached at middle. Pistil c. 7 mm. long, ovary c. 2 mm., glabrous. Fruits slender, twisted up to 3–3·5 cm. long, glabrous.

Thailand. Surat. Ban Kawp Kep, on limestone rocks in evergreen forest, c. 100 m., 16 Aug. 1927, *Kerr* 13362 (K, holotype, BKF, isotype):— flowers pink.

Boea glabrisepala (*B. L. Burtt*) *Barnett*, comb. nov.

Paraboea glabrisepala B. L. Burtt in Bull. Misc. Inform. Kew 1941: 21 (1941) and Not. Roy. Bot. Gard. Edin. 22: 311 (1958).

Thailand. Payay. Doi Chiengdao, c. 600 m., 28 Aug. 1935, *Garrett* 1001 (K, holotype); same locality, 14 Aug. 1949, *Garrett* 1260 (K).

Boea minor *Barnett*, sp. nov. *B. glabriflorae* Barnett affinis sed manifeste minor, foliis minoribus apice acutis vel subacutis neque rotundatis, tomento candidiore differt.

Plants small, stems short with felting of fine white tangled hairs, jointed by the amplexicaul bases of the opposite leaves. Leaves crowded at apices of stems, opposite, lanceolate or ovate or oval, apex acute or sub-acute, base rounded or cuneate, upper surface pale greyish-green, when young with felting or tangled white hairs, later becoming almost glabrous, lower surface very pale, almost white, with close felting of white hairs, 4–5 cm. long, 1·6–2·8 cm. wide, margin slightly crenate, lateral nerves 4–5 pairs, subprominent below, somewhat obscure above; petioles up to c. 2 cm. long, with felted tomentum, the wide amplexicaul bases of the opposite pairs meeting round the stem. Inflorescences axillary, dichasial; peduncles slender up to c. 9 cm. long, reddish, almost glabrous but with a few scattered tangled hairs; bracts at apices 2, narrow linear, acute, glabrous; pedicels very slender, c. 1·5 cm. long, glabrous or with scattered remains of tangled hairs. Calyx 5-partite almost to base, lobes linear c. 1·5 mm. long, subacute, glabrous, persistent. Corolla c. 1·7 cm. across open flower 5-lobed to c. half depth, the 3 anterior lobes slightly longer than the 2 posterior, all rounded. Stamens 2, filaments short, arising from the base of the corolla, flattened, c. 2 mm. long, anthers reniform c. 3 mm. long, 2 mm. wide, coherent by anterior edges. Ovary and style glabrous, stigma minute. Fruits slender, twisted, just over 2 cm. long.

Thailand. Nakawn Sritamarat. Songkla, on Kao Keo. Plants from this locality cultivated in Bangkok, 29 Sept.–6 Oct. 1929, *Kerr* 17575 (K, holotype, BKF, isotype):—flowers pale blue.

Boea reticulata *Barnett*, sp. nov. *B. multifloram* R. Br. habitu, tomento caulis foliorum inflorescentiae fulvo, necnon nervis paginae inferioris prominentibus simulans, sed foliis pro rata latioribus, nervis lateralibus paucioribus, petiolis manifeste longioribus, pedunculis brevioribus, floribus in quaque inflorescentia paucioribus differt.

Rootstock short, leaves all radical, chartaceous, oval or obovate, apex rounded, base narrowed or cuneate or may be sub-cordate, upper surface pale greenish, glabrous, lower rich reddish-tawny tomentose on the very prominent nerves and transverse veins, pubescent between the veins, 5·7–11·5 cm. long, 3–5·7 cm. wide, lateral nerves 4–6 pairs, margin crenate especially towards the apex; petioles stout up to c. 4·5 cm. long, tawny tomentose. Inflorescences dichasial; peduncles axillary, slender up to 10-11 cm. long, tawny tomentose but becoming glabrous in parts; bracts at apices 2, small narrow linear acute c. 3–4 mm. long, tawny tomentose below, glabrous above; pedicels short c. 5 mm. long, tawny tomentose. Flowers c. 20 per dichasium, small c. 0·5 cm. across. Calyx tomentose 5-partite almost to base c. 2·5 mm. long, segments linear obtuse c. 2 mm. long. Corolla 5-partite almost to base, the two posterior lobes slightly wider than the other three and covering them in bud, with slight tawny pubescence without, the others glabrous. Stamens 2, filaments arising a little above the base of the corolla, very short c. 1–1·5 mm. long, thick, anthers large widely oval or almost rotund, rather flat, 2-celled divaricate at base, coherent by flat inner faces, with short whitish pubescence especially towards the centre of the outer faces. Ovary c. 2 mm. long, style c. 1·5 mm. long almost if not quite glabrous, but may have a few scattered hairs towards the stigma.

Additional description taken from *Winit* 740.

Fruits slender c. 1·5 cm. long, twisted, beaked, almost glabrous, but with scattered short pubescence. Seeds very tiny, widely oval, apiculate at both ends.

THAILAND. PAYAP. Chiengmai, Me Wang, common on rocks near streams in mixed deciduous forest, c. 400 m., 19 July 1922, *Kerr* 6356 (K, holotype, ABD, isotype):—flowers white. MAHARAT. Lampang Ne Ngow, on damp rocks, 420 m., 25 Aug. 1922, *Winit* 740 (BKF, K).

Dichiloboea albida *Barnett*, sp. nov. *D. speciosae* Stapf proxima, sed foliis multo minoribus ac angustioribus, pubescentia alba, lobo calycino postico haud cucullato differt.

Small woody plants, young twigs softly white pubescent, later becoming glabrous. Leaves lanceolate or oblanceolate, acute, narrowed to base, c. 4·8–6 cm. long, c. 1·4–1·9 cm. wide, coriaceous, but brittle when dry, upper surface pale olive-green, shortly white pubescent becoming glabrous, lower white tomentose, lateral nerves obscure above, prominent below c. 9 pairs, margin obscurely crenate; petioles short up to c. 1 cm. long, base amplexicaul, white tomentose. Peduncles axillary up to c. 10 cm. long, bearing several almost sessile flowers, white tomentose; bracts very wide, rounded, white tomentose below, green glabrous above, c. 1·2 cm. wide, 0·8 cm. long. Calyx c. 0·9 cm. deep, covering less than half of the corolla, white tomentose, 3-lobed, the posterior lobe almost or quite entire, 0·8 cm. wide, anterior lobes almost free c. 0·5 cm. wide. Corolla glabrous, wide campanulate, c. 1·8 cm. long, nearly 2 cm. wide at mouth, lobes widely rounded, imbricate c. 0·5 cm. deep. Stamens 2, pubescent, filaments arising from base of corolla, thickish c. 6 mm. long, curving to meet the anthers; anthers reniform, coherent by edges, glabrous. Ovary pubescent, c. 6 mm. long, 3 mm. wide, narrowing to style c. 1·1 cm. long, slightly pubescent, stigma small c. 1 mm. long, slightly grooved on one side. Capsule, white pubescent, twisting early.

THAILAND. AYUTHIA. Saraburi, Kao Pang Sawang, Muak Lek, 16 July 1925, *Nai Noe* 120 (K, holotype, ABD, BKF, isotypes):—flowers purple with sweet scent.

Dichiloboea acaulis *Barnett*, sp. nov., a ceteris speciebus habitu acauli differt.

Acaulescent herb; rootstock long, rugged. Leaves in close rosette at apex of rootstock, linear-lanceolate, apex narrowed, rounded, narrowed to base then widening to winged petiole, margin irregularly crenate, up to c. 8 cm. long, 1·5–2 cm. wide, upper surface greenish, densely pilose, lower densely white-woolly, tawny towards the base. Peduncles axillary, tawny woolly, single flowered. Bracts 2 at apex of peduncle, white woolly without, brownish-green with white overlapping hairs within, 1·5 cm. long, 0·8 cm. wide, oblanceolate, tapering to base, pedicel very short, tawny woolly. Calyx white woolly without, tawny glabrous within, 3-lobed, the 2 anterior lobes free c. 7 mm. long, c. 4 mm. wide, posterior lobe c. 8 mm. long and wide, shallowly 3-lobed, the lobes triangular. Corolla widely campanulate, mouth oblique, c. 1·5 cm. long posteriorly c. 1·8 cm. long anteriorly, c. 3 mm. wide at base then widening abruptly to c. 1·8 cm. at limb, glabrous without,

pubescent in patches within. Stamens 2, filaments arising from base of corolla, c. 4 mm. long, twisting before union with anthers, anthers coherent, large, c. 2·5 mm. wide and long, lobes divergent, brown, shortly pubescent. Ovary short, conical, c. 2 mm. long, glabrous, style long stretching well beyond the anthers, then curving back, c. 1·2 cm. long, stigma c. 1·5 mm. long, slightly wider than style.

Fruits described from *Put* 350.

Capsule short and stout narrowed to apex and slightly to base, c. 2 cm. long, nearly 5 mm. wide in middle, stretching little beyond the persistent calyx, glabrous, twisted, seeds on inner surfaces of incurved placentas.

Thailand. Payap. Chiengmai, Doi Chiengdao, common on rocks in rocky ridge, 1100 m., 15 July 1958, *Smitinand* 4688 (E, holotype):—herb; flowers purple; same locality, on rocks, 16 Oct. 1926, *Put* 350 (K).

Dichiloboea glandulifera *Barnett*, sp. nov., a ceteris speciebus adhuc descriptis statura multo minore, foliis minoribus, inflorescentis dichasialibus, foliis bracteis calycibus glanduliferis differt.

Small woody plants, stems slender c. 2–2·5 mm. diameter, up to c. 8 cm· long, jointed by the amplexicaul bases of the petioles, the main stem appearing to wither early, axillary branches taking its place, pale tawny or whitish pannose-tomentose, later becoming almost glabrous. Leaves opposite or alternate, lanceolate or oblanceolate, apex rather abruptly acute, base narrowed, 1·9–4 cm. long, 0·9–1·5 cm. wide, chartaceous, upper surface dark brown, arachnoid, hairs long, thin, sparsely septate, lower surface tawny-yellow pannose-tomentose especially on the lateral nerves, both surfaces with numerous small spherical glistening yellow glands, margin minutely crenate towards the apex, lateral nerves 4–5 pairs, subprominent below, faint above; petioles short c. 0·45 cm. long, deeply caniculate above, bases amplexicaul, pannose-tomentose. Inflorescences dichasial. Peduncles axillary, slender, glabrous or with scattered remains of tomentum, up to 6 cm. long, pedicels almost glabrous as peduncles, up to c. 4 cm. long; bracts and bracteoles wide, apices rounded, c. 3–4 mm. long. c. 2·5 mm. wide, clasping the peduncles and pedicels respectively, glandular. Calyx persistent, glandular, 3-partite to base, posterior lobe wide hooded, very slightly 3-lobed at apex, to 6 mm. long, 5 mm. wide in middle, slightly narrowed to base, anterior lobes c. 5·5 mm. long, c. 2 mm. wide, rounded at apex, slightly narrowed to base, margins of all lobes scarious. Corolla obliquely campanulate, c. 2·5 mm. wide at base, narrow for c. 2·5 mm. then widening, especially anteriorly to the 5-lobed limb, posterior lobes more or less erect, rounded c. 1 cm. deep, anterior lobes rounded, two lateral c. 4 mm. wide, c. 2 mm. deep, central lobe c. 4 mm. deep. Stamens 2, filaments arising from base of corolla, short and flat c. 3 mm. long, 0·5 mm. widening to c. 1 mm. at union with anthers, anthers reniform, c. 3 mm. wide, 2 mm. long, coherent by apices. Ovary c. 4 mm. long, style and stigma c. 7·5 mm., stigma slightly widened, glabrous. Capsules up to 2·4 cm. long, with fine beak, twisting early, glabrous.

Thailand. Nakawn Sawan. Me Lamung, Kampengpet, c. 800 m., on rocks in open ground, 9 June 1922, *Kerr* 6102 (K, holotype, ABD, BKF, isotypes):—flowers purple.

Dichiloboea glabrescens *Barnett*, sp. nov. *D. albidam* Barnett habitu revocans, sed inflorescentia fere vel omnino glabra (bracteis nonnullis pube brevi alba hic illic nonnunquam indutis) differt.

Stem woody whitish-tawny tomentose. Leaves coriaceous, lanceolate, apex acute, base cuneate, up to c. 9 cm. long, c. 3 cm. wide, very finely serrate-crenate, very dark brownish glabrous above, tawny-white tomentose below, lateral nerves prominent below, 11–13 pairs; petioles up to 1·5 cm. long, tomentose as stem, slightly amplexicaul. Inflorescences axillary, up to c. 10 cm. long; peduncles glabrous, pale brown. Bracts wide hemispheric almost if not entirely glabrous, c. 1·6 cm. long, c. 2 cm. wide. Calyx glabrous or with scattered puberulent patches, 3-lobed, the 2 anterior lobes oval, widely rounded at apex, c. 1 cm. long, 0·5 cm. wide, posterior lobe wide, shallowly 3-lobed, c. 1 cm. long, 0·7–0·8 mm. wide, glabrous without, puberulent patches within. Corolla campanulate, to c. 1·7 cm. long, c. 1·8 cm. wide at mouth, 5-lobed, lobes widely rounded, somewhat unequal. Stamens 2, filaments from base of corolla, flat, twisted and widening to union with anthers, c. 4 mm. long, anthers reniform, c. 0·5 cm. long, c. 0·4 cm. wide, coherent. Ovary glabrous c. 3 mm. long, style long, very shortly pubescent. Capsule twisting early.

Thailand. Rachaburi. Kanburi, Baw Re, among rocks, 19 July 1926, *Put* 175 (K, holotype, ABC, BKF, isotypes).

Dichiloboea strobilacea *Barnett*, sp. nov. *D. speciosae* (Ridl.) Stapf affinis, foliis ovatis neque lanceolatis, pagina superiore pilis brevibus basi bulbosis induta inferiore denique fere glabra, bracteis glabris, calycis labio posteriore trilobo nec integro differt.

Stem woody, ridged, soft tawny tomentose, the older parts bearing the persistent bases of the amplexicaul petioles. Leaves opposite (in specimen somewhat torn) ovate or ovate-lanceolate, shortly acuminate, narrowed to base, 11–14 cm. long, 4·5–5 cm. wide. (One torn leaf c. 7 cm. wide, length unknown), margin slightly crenate, upper surface dull tawny-green with short 3–4-celled hairs, basal cell bulbous, terminal fine-pointed, lower surface becoming almost glabrous except for the tawny tomentose margin and nerves, lateral nerves prominent below, 10–15 pairs, curving upwards short of margin; upper leaves almost sessile, lower petiolate, petioles up to nearly 4 cm. long, canaliculate above, tawny tomentose, widely amplexicaul, bases of opposite petioles meeting round stem. Peduncles up to c. 5 cm. long, tawny tomentose, terminal strobilus to c. 4 cm. long, 2 cm. wide. Bracts wide hemispherical overlapping, to c. 3 cm. wide, 2 cm. deep, becoming glabrous. Calyx thin 3-partite to base, the 2 anterior lobes oblanceolate c. 1·1 cm. long, 0·5 cm. wide, the posterior c. 1 cm. wide, 3-lobed, lobes c. 5 mm. deep. Corolla campanulate c. 1·5 cm. long, c. 3 mm. wide at base, widening gradually to c. 1 cm. at the slightly oblique 5-lobed limb, lobes rounded, c. 0·5 cm. wide and deep. Stamens 2, filaments arising from base of corolla, c. 2 mm. long, twisted, flat nearly 1 mm. wide, anthers large, brown, glabrous coherent, c. 4·5 mm. wide and deep. Pistil very slightly pubescent, c. 1 cm. long, ovary c. 3 mm. long tapering to long style, stigma flattened c. 1·5 mm. long. Disc lobed, very shallow, less than 1 mm. deep. Fruits unknown.

Thailand. Rachaburi. Kanburi, Baw Re, among rocks, 18 July 1926, *Put* 172 (K, holotype, ABD, isotype).

Agriculture and ecology in Africa.*—Although Africa is the second largest continent, with about 23 per cent. of the world's total land surface, its population in 1953 was estimated to be no more than 213 millions. The background of this great continent is very often one of actual poverty—in the fertility of its soils, in the area and production of its crops, in the number and health of its cattle, and in the material well-being of its peoples.

Most Africans still live their lives in the closest association with the soil which produces food for them and their stock; and in the future also this must for some time be the inevitable pattern. Compared with that of other continents, the development of industry is still small and local; 73 per cent. of the population are engaged in agriculture, forestry or related activities, as compared with 32 per cent. in Europe, and only 5 per cent. in Britain.

Professor Phillips, in this book, describes the pattern and balance of nature in its widest sense in Africa south of the Sahara, and more especially man's place in the scheme. He uses the correlations between soil, rainfall and temperature to produce a classification of the vegetation of tropical Africa, against the background of which the future possibilities for agricultural development may be more clearly estimated. Progress, it seems, depends on man's capacity to alter that balance of nature for his own purpose, by replacing, for example, the indigenous vegetation by crops, or by growing these in rotation with it, although the author considers that the traditional shifting cultivation must be modified, and in the end displaced by better methods. Insufficiently planned attempts in the past to alter the balance have sometimes ended in disaster, and one of the most important parts of this book consists of the author's suggestions about how such schemes in the future should be carefully thought out beforehand.

Much damage is at present done by man through processes causing gradual deterioration and whittling away of resources of trees, soil and water. Unfortunately the author gives us no clear idea about how this evil is to be cured in the near future, beyond a probably too hopeful trust in an improvement of the standard of general education, and in getting people to think along ecological lines. We have scarcely learnt to do this in Europe; is it to be hoped that Africa will be taught the lesson in a shorter time? This is unquestionably an important book which should be read and digested not only by agriculturalists concerned with Africa but by politicians who are planning her future. It is not altogether easy reading, and the too numerous clichés and an irritating addiction to grammatical inversions do not help.

J. P. M. Brenan

Window-box gardening.†—For those who live in town where no garden is available, this little book will be specially valuable. It contains instructions for making window-boxes and balcony-boxes with clear diagrams to help in their construction. A list of suitable plants in alphabetical order is also provided.

H. S. Marshall

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* *Agriculture and Ecology in Africa*. A Study of Actual and Potential Development South of the Sahara. By John Phillips. Pp. 424, with a folding map. London: Faber & Faber Ltd., 1959. Price 63s.

† *Window-box gardening*. 'Amateur Gardening' Handbook No. 33. By P. R. S. Hunt. Pp. 91, 29 line-drawings. London: W. H. & L. Collingridge Ltd., 1959. Price 4s.

Fungi venezuelani: V*

THE CYPHELLACEAE OF VENEZUELA

Derek A. Reid

The present paper is largely based upon the collections of Cyphelloid fungi made by R. W. G. Dennis in Venezuela during 1958**, in the course of an expedition financed by the Percy Sladen Trust. These fungi all appear to belong to previously undescribed taxa, with the exception of two gatherings referred to *Calyptella capula* (Holmskj. ex Pers.) Quél.

Since the type species of the genus *Cyphella*—*C. digitalis* has been shown to belong in the genus *Aleurodiscus* the new taxa published in this paper have been assigned where possible to more recent generic segregates. However, when the affinities of a species are uncertain, it has been referred to the genus *Cyphella* sensu lato. Detailed generic descriptions have also been included as many of the genera recognised in this work are relatively little known.

Calyptella *Quél.*

Fructifications delicate, stipitate-cupulate or wine-glass shaped, appearing glabrous to the eye but often very minutely and sparsely tomentose under a lens. *Hyphal structure* monomitic, consisting of thin-walled, branched, hyaline, generative hyphae which bear clamp-connexions at some, if not all, of the septa. These hyphae become inflated and may reach 24μ in diam. In many species, including the type species, *C. capula* (Holmskj. ex Pers.) Quél., the outermost hyphae produce small wart-like swellings along their length and these grow out into well-developed, much-branched coralloid processes which clothe the external surfaces of the cup. *Spores* hyaline, elliptical, pip-shaped or subcylindrical.

Calyptella capula (*Holmskj. ex Pers.*) *Quél.* in Ench. Fung.: 216 (1886).

Cyphella capula (Holmskj. ex Pers.) Fr. in Epicrisis: 568 (1838).

Two collections (*Dennis* 1297 & 2429) have been referred to this species after some hesitation, since both have fructifications which are rather smaller than the typical European fungus.

Dennis 1297:—*Fructifications* immature, scattered, white, pendulous, up to 1000μ high and 900μ wide, with the stalk 200μ in length. *Hyphal structure* monomitic, consisting of thin-walled, hyaline, branched, generative hyphae, many of which become inflated and reach 10μ in width, with clamp connexions at some of the septa. [Bourdot and Galzin (1928) have stated that clamp connexions are absent in this species but their observation is erroneous]. The outermost hyphae develop small wart-like swellings along their length and these grow out into much branched coralloid processes. Similar processes occur on the external surfaces of the European fungus although

* Continued from Kew Bull. 15: 156 (1961).

**For sketch-maps showing the localities visited by Dennis see Kew Bull. 14: 421, 422 (1960).

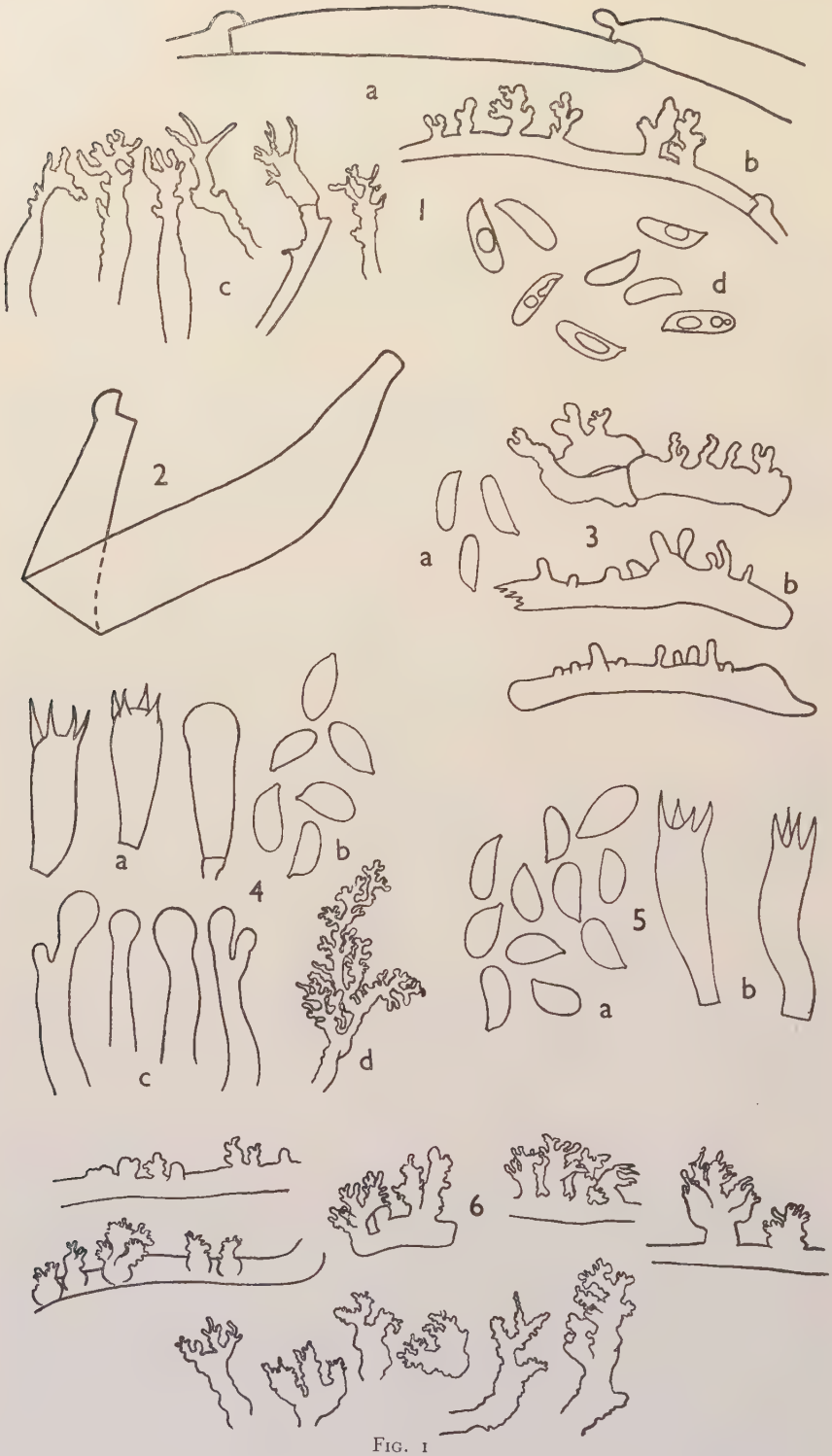

FIG. 1

hitherto they appear to have been completely overlooked. *Basidia* immature. *Spores* not seen. Fig. 1/6.

HABITAT: on dead fallen petioles and grass, Botanic Garden, Caracas, 19 June 1958, *Dennis* 1297.

Dennis 2429:—*Fructifications* scattered, white, funnel-shaped, up to 2000μ high when soaked up in potassium hydroxide solution, with rather short stalks. *Hyphal structure* as in the preceding collection, but the coralloid processes on the outer surface of the fruitbodies were not observed. There is, however, an outer layer of uncertain structure which may represent these processes, but if so they have become matted together and are no longer clearly distinguishable. *Basidia* 23–28·6 × 5–8μ, subcylindrical to subclavate, with 4 sterigmata up to 5·5μ in length. *Spores* 8·5–9·5 (–12) × 4—5μ, elliptical or pip-shaped with an oblique apiculus.

HABITAT: on woody herbaceous stems, Laguna Negra, Sierra de Sto. Domingo, Edo. Mérida, 27 July 1958, *Dennis* 2429. Fig. 1/5.

Assuming these two collections represent a single taxon the combined description would be indistinguishable from that of European *C. capula* apart from the size of the fructifications.

Calyptella cylindrospora *Reid*, sp. nov.

Sporophora usque ad 1000μ alta, stipitata, cupulata vel infundibuliformia, sub lente pruinosa. *Stipes* brevis, usque ad 250μ longus. *Hypharum systema* monomiticum; hyphae generatoriae, inflatae usque ad 15μ diametro, hyalinae, septatae, fibulatae, ramosae, muris tenuibus. Superficies exterior hyphis coralloideis vestita. *Basidia* 30 × 6μ, quadrispora. *Sporae* 9·5–12 × 3·5–3·75μ, cylindricae, hyalinae, 1–3-guttatae.

HABITAT: on base of palm leaf in forest, Los Guayabitos, Edo. Miranda, 8 June 1958, *Dennis* 1343, type; on dead rotting stems of *Polymnia riparia* at 1200 m. alt., Cortada del Guayabo, Edo. Miranda, 9 July 1958, *Dennis* 1227.

Fructifications up to 1000μ in total height, consisting of a short stalk 250μ long which expands into a white, pendulous, cupulate or funnel-shaped fertile portion 800μ high and 700μ wide. The fruitbodies when examined under a lens appear minutely pruinose. *Hyphal structure* monomitic, consisting of thin-walled, hyaline, branched generative hyphae, many of which become inflated and reach 15μ in width, with clamp connexions at the septa. The fertile portion of the fungus is formed of a layer of basidia up to 30μ wide lining the inside of the cup, above this is a well defined subhymenial zone up to 26μ in thickness, followed by the flesh which is also up to 26μ thick. It would seem that most of the strongly inflated hyphae are situated just above the subhymenium. From along the length of the outermost hyphae of the fruitbody arise numerous peg-like swellings which

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FIG. 1. 1. *Calyptella cylindrospora* (from the type, *Dennis* 1343), (a) inflated hypha, (b) hypha from surface of fruitbody showing the development of coralloid processes, (c) coralloid processes from rim of fruitbody, (d) spores. 2. *Cyphella mauritiae*, (a) inflated hypha. 3. *Calyptella cylindrospora* (from *Dennis* 1227), (a) spores, (b) hyphae from surface of fruitbody showing the development of coralloid processes. 4. *Cyphella coralloderma*, (a) basidia, (b) spores, (c) sterile elements from margin of fruitbody, (d) coralloid hypha from surface of fruitbody. 5. *Calyptella capula* (from *Dennis* 2429), (a) spores, (b) basidia. 6. *Calyptella capula* (from *Dennis* 1297), coralloid processes from surface of fruitbody. All × 830.

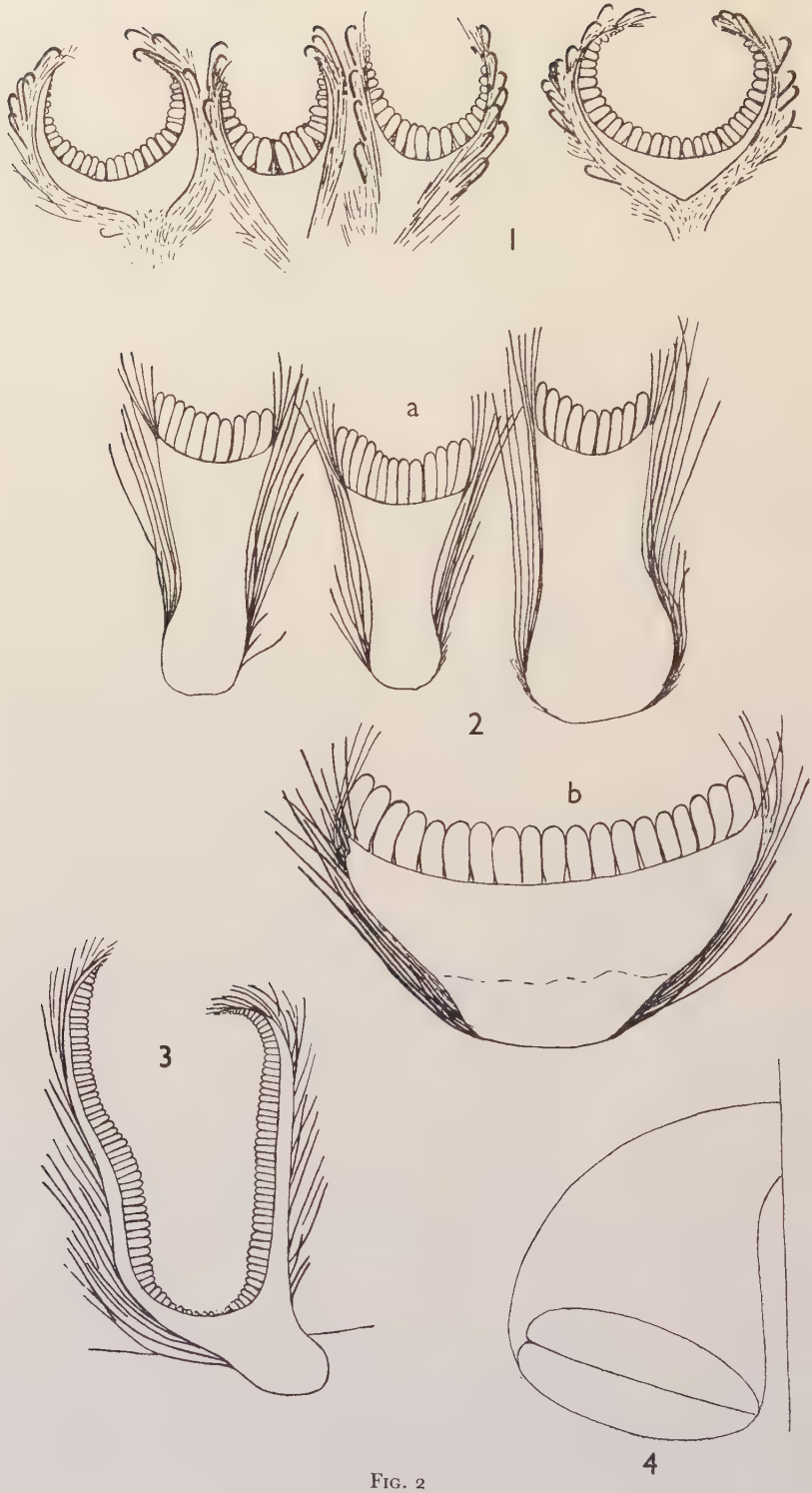

Fig. 2

grow out into branched, coralloid processes. These are specially well developed on the stipe and also near the rim of the cup where they have a more basidiomorphous appearance. *Basidia* 4-spored, 30 × 6μ. *Spores* 9·5–12 × 3·5–3·75μ, cylindrical, thin-walled, hyaline, with 1–3 guttules. Fig. 1 *1*, 3, p. 262.

Cyphellopsis *Donk emend. Reid*

Fructifications solitary, or densely gregarious and then seated on a common subiculum, yellowish or brownish with pale coloured hymenia, cupulate, turbinate or tubular, sessile or narrowed below into a broad stipe-like base; covered exteriorly with numerous stiff brown hairs which overarch and completely cover the hymenial surfaces of dried specimens. *Hyphal structure* monomitic, consisting of rather narrow, thin-walled, hyaline, branched generative hyphae with clamp connexions at some, if not all, of the septa. Towards the outer surface of the cups the hyphae develop slightly thicker brownish walls, and from these arise the hairs which clothe the fruitbodies. These hairs, which are not distorted by potassium hydroxide solution, have slightly thickened brown walls, are non-septate (except perhaps, rarely, near the extreme base) and are covered with a fine granular encrustation. Frequently they develop strongly enrolled apices which may be thin-walled and hyaline; the actual apices vary in shape from acute or obtuse to irregularly clavate or capitate. Towards the base these hairs may narrow slightly or they may remain much the same width throughout. *Basidia* broadly clavate. *Spores* hyaline or yellowish, varying in shape from subcylindric, elliptical, or broadly elliptical to subglobose.

Cyphellopsis subglobispora *Reid*, sp. nov.

Sporophora 150–200μ alta, 130–150μ lata, subglobosa vel turbinata, sessilis vel deorsum leviter attenuato-stipitata, dense stipata, super mycelium tenue insidentia, brunnea hymenio cremeo vel albido. *Hypharum systema* monomiticum. Hyphae generatoriae 2–2·5μ diam., hyalinae, septatae, fibulatae, ramosae, muris tenuibus. Superficies exterior pilis 2–3μ diam. granulis incrustatis, continuis, patenti-recurvis vestita. Pili granulis incrustati, muris brunneis leviter crassiusculis, apice saepe hyalino inflato. *Basidia* usque ad 28·6 × 10μ, quadrispora, late clavata. *Sporae* hyalinae, late ellipsoideae vel subglobosae 7–8·5 × 5–6·5μ.

Habitat: on twigs with *Lachnella subfalcispora* Reid, Botanic Garden, Caracas, Dto. Federal, 30 June 1958, *Dennis* 1472A, type.

Fructifications 150–200μ high, 130–150μ wide, subglobular or turbinate, sessile or narrowed below into a short thick stipe-like base 40–50μ long and 40μ wide, densely gregarious on a common subiculum forming scattered colonies, brown with pale cream or whitish hymenium. The exterior surfaces are thickly covered with brown hairs which overarch and completely cover the hymenial surface. *Hyphal structure* monomitic, consisting of

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Fig. 2. 1. *Cyphellopsis subglobispora*, sections through fruitbodies, × 160. 2. *Lachnella subfalcispora*, (a) sections through substipitate-cupulate fruitbodies, (b) section through a discoid fruitbody, × 160. 3. *Lachnella villosa* (determined by Patouillard), (a) section through fruitbody, × 160. 4. *Cyphella coralloderma*, (a) sketch of fruitbody showing the dividing fold, × 90.

thin-walled, hyaline, branched, generative hyphae 2 ·2·5μ in diam., which appear to have clamp connexions at some of the septa. These hyphae grow up vertically in the stipe-like base of the fruitbody and then diverge to form the fleshy base of the cup which is 25 ·70μ in thickness, but thin out rapidly in the cup itself until represented by little more than the thickness of a single hypha near the rim. Toward the inside of the cup these hyphae give rise to a layer of basidia (without a subhymenial zone) of which only the upper portion stains deeply in aniline blue in lactic acid to form a zone 25μ thick. Toward the outside of the cup the hyphae develop slightly thicker, brownish walls and become more highly branched, and from these arise the very numerous, granule encrusted hairs which cover the fructifications. The hairs, 2–3μ in diam., have slightly thickened brown walls and strongly enrolled, crozier-like apices, the tips of which often become swollen and irregularly clavate or capitate. When traced towards their base these hairs do not appear to narrow markedly; they can be traced back to a septum but it is difficult to know if this is primary or not since clamps in this species tend to be abortive and are often represented by mere peg-like outgrowths near the septa. *Basidia* up to 28·6 × 10μ, 4-spored, broadly clavate, tapering to a very narrow base. *Spores* hyaline, broadly elliptical to subglobose, 7–8·75 × 5–6·5μ (including the apiculus). Fig. 2/1, p. 264; 3/2, p. 270.

Cyphellopsis subglobispora is most closely related to **Cyphellopsis mellea** (*Burt*) *Reid*, comb. nov. (*Cyphella mellea* Burt in Ann. Miss. Bot. Gard. 1: 372 (1914)). It is distinguished from this latter species by its larger spores.

Lachnella *Fr. emend. Donk*

Fructifications villose, pure white with pale cream or violaceous hymenia, cupulate, becoming globular or turbinate when dry, narrowed below to form a rather broad, well defined or very reduced stipe like base; either scattered or densely crowded in small colonies. *Hyphal structure* monomitic, consisting of densely compacted, indistinct, hyaline, generative hyphae which appear to be somewhat agglutinated in the extreme basal portion of the fruitbody of certain species (*L. tiliae*, *L. subfalcispora*). The exterior surface of the fruitbody is enveloped in a sheath of very long, more or less adpressed, cylindrical, stiff, granule encrusted hairs, which overarch and completely obscure the hymenium during dry conditions. Most of these hairs arise near the extreme base of the fructifications, sometimes on a basal tubercle-like swelling, but in some species at least there appears to be a further ring of hairs developed just beneath the rim of the cup. The hairs, which are pseudoamyloid, have thickened hyaline walls which thin out towards the obtuse often slightly swollen apices and also towards the extreme base. They frequently develop secondary septa along their entire length and are heavily encrusted with a fine granular deposit which is soluble in potassium hydroxide solution. When mounted in the latter reagent the hairs become very swollen and distorted, either locally or in their entirety. *Cystidia* and *Gloeocystidia* absent, but spindle-shaped basidioles may be present (*L. villosa*). *Basidia* large, clavate, with 2–4 prominent, curved, horn-like sterigmata. *Spores* large (10–20μ long), smooth, hyaline, nonamyloid, obovate, irregularly obovate or subfalcate (broadest toward the base), with prominent oblique or lateral apiculus.

Lachnella subfalcispora *Reid*, sp. nov.

Sporophora minuta, villosa, alba, in vivo cupulata (200μ alta, 300–400μ lata) vel substipitato-cupulata (250μ alta, 100–150μ lata), in sicco subglobosa vel turbinata, dense stipata. *Hypharum systema* monomiticum. Hyphae generatoriae angustae, hyalinae, obscurae, confertae. Superficies exterior pilis 4–5μ diam., elongatis, rigidis, ± adpressis, cylindricis, pseudoamyloideis, saepe septatis, muris crassiusculis, vaginata. *Basidia* magna, usque ad 12μ lata, clavata, quadrispora. *Sporae* subfalcatae, 15·5–17 × 5–6·5(·7)μ.

Habitat: on twigs with *Cyphellopsis subglobispora* Reid, Botanic Garden, Caracas, Dto. Federal, 30 June 1958, *Dennis* 1472, type.

Fructifications minute, villose, white, either cupulate (200μ high, 300–400μ wide) or more frequently substipitate-cupulate (250μ high, 100–150μ wide) when fresh, becoming subglobose or turbinate when dry, densely crowded in small colonies. *Hyphal system* monomitic, consisting of densely compacted, hyaline, narrow, indistinct, generative hyphae. Toward the extreme base of the fruitbodies the hyphae appear to be somewhat agglutinated. The fructifications are completely enveloped by a sheath of very elongated, rigid, more or less adpressed, pseudoamyloid hairs which are covered by a fine encrusting granular substance. These hairs have thickened hyaline walls which thin out toward the apices, which may be slightly swollen, and also toward the extreme base; they frequently develop secondary septa along their entire length. When mounted in potassium hydroxide solution the encrusting deposit dissolves and the hairs become locally swollen and very distorted. Examination of sections and squashes would seem to indicate that the hairs originate on two distinct areas on the fruitbody. The first arise near the very base of the fructification; often on a slight basal tubercle-like swelling. These hairs are very elongated, reaching 170–195μ in length and 4–5μ in width, and are more or less adpressed to the sides of the fruitbody which they mostly overtop. The hairs originate from thin-walled generative hyphae, to which they are joined by a clamp connexion, and have conspicuously narrowed bases. The second appear to arise just beneath the rim of the cup. These are shorter, 78–91μ in length, and have less elongated narrow bases. It is probable that it is this inner whorl of hairs that curves over and protects the hymenium during dry conditions. *Basidia* large, clavate, up to 12μ wide, bearing 4 prominent, curved, horn-like sterigmata. *Spores* subfalcate, 15·5–17 × 5–6·5(–7)μ. Fig. 2/2, p. 264; 3/6, p. 270.

This species closely approaches *L. tiliae* (Peck) Donk apud Sing., but is much smaller and has rather more distinctly falcate spores with more pointed apices.

Lachnella caracasana *Reid*, sp. nov.

Sporophora villosa, alba, in vivo cupulata 300–500μ alta, 300–400μ lata, in sicco subglobosa. *Hypharum systema* ei *Lachnellae subfalcisporae* similis. *Sporae* elongatae, irregulariter obpyriformes, 12–17 × 5–8μ.

Habitat: on twigs, Botanic Garden, Caracas, Dto. Federal, 14 July 1958, *Dennis* 1876, type.

Fructifications scattered, villose, white, cupulate (300–500μ high, 300–400μ wide) becoming subglobose when dry, but narrowed below into a very

short stipe-like base which is usually buried beneath the superficial layer of bark. *Hyphal system* as in *Lachnella subfalcispora* but in this species the hyphae in the basal region of the fruitbody are even more agglutinated. The hairs which sheath the fructifications arise in a similar manner and become distorted and swollen in potassium hydroxide solution. *Spores* elongated, somewhat asymmetrically obpyriform, 12–17 × 5–8μ. Fig. 3/4, p. 270.

This species is very closely related to *L. tiliae* (Peck) Donk apud Sing. and to *L. subfalcispora* Reid, but differs from both these species in the shape of its spores. Since the various collections of *L. villosa*, *L. alboviolascens* and *L. tiliae* examined have very constantly shaped spores it would appear that this is a reliable indication of specific limits within the genus.

Lachnella villosa (*Pers. ex Schw.*) *Gillet*

Patouillard & Gaillard (1888) listed two Venezuelan gatherings of this species from Atures, (*Gaillard* 104 and 223), but beyond stating that the fruitbodies occurred in large numbers on dead leaves of various plants, he published no data concerning the material. However, examination of collection No. 223 has shown it to be wrongly named. It is certainly not *L. villosa*, nor is it a species of *Lachnella*. The probability is that this collection represents a new taxon, but since it is sterile it would seem very undesirable to publish it as a new species. Nevertheless a description of the gathering is given below:—

Fructifications white, villose, more or less tubular (400μ high, 220μ wide) expanding slightly toward the apices but contracted suddenly at the base into a very short stipe (60μ long, 60μ wide) which may be partly immersed in the tissues of the leaf; margin enrolled. *Hyphal structure* monomitic. The fruitbodies are extremely thin and delicate with the walls of the tube only 40μ in thickness. The inside of the tube is lined with a layer of immature basidia, 8–15μ in width, except for the extreme base opposite the point of attachment of the stipe where basidia appear to be completely lacking. This is followed by the flesh which is 15μ thick and finally by the hairs, 60–300μ in length, 2·5–3μ in width, which entirely cover the fruitbody. These hairs which arise anywhere on the outer surface of the fructification, have long narrow drawn out bases which can be traced back to a clamp-connexion. They also narrow gradually toward the apices which may be subacute. The hairs which have thickened walls except in the apical portion where they can be seen to be secondarily septate, are covered with a fine encrusting granular deposit which is soluble in potassium hydroxide solution, but do not become swollen and distorted in this reagent. *Basidia* immature, but very short and rather broad, 12–19 × 4·75–6·5μ. *Spores* not seen. Fig. 2/3, p. 264; 3/3, p. 270.

Habitat: on fallen leaves of various plants, Atures, 29 April 1887, *Gaillard* 223 in Herb. Farlow.

[N.B. It has not been possible to examine *Gaillard* 104].

Flagelloscypha *Donk apud Sing.*

Fructifications gregarious, white, villose, cupulate becoming globular when dry. *Hyphal structure* monomitic, consisting of thin-walled, narrow, branched, hyaline, generative hyphae with clamp-connexions at the septa. The exterior surface of the fruitbody is covered by long, narrow, continuous hairs,

with slightly thickened walls which thin out toward the tapering, whip-like apex and toward the base. These hairs which arise anywhere on the outer surface are densely covered with detersile rod-like crystals except toward the tip and base. When mounted in potassium hydroxide solution the crystalline material dissolves but the hairs are otherwise unaffected. They may narrow somewhat towards the base and can be traced back to a thin-walled hypha to which they are joined, by a clamp-connexion. The hairs are unaffected by Melzer's reagent. *Cystidia* and *Gloeocystidia* absent. *Basidia* clavate, rather large. *Spores* smooth, thin-walled, hyaline, nonamyloid, varying in shape from subcylindric, elliptic, pip-shaped or subglobose to amygdaliform and in size from small to very large.

Flagelloscypha polylepidis *Reid*, sp. nov.

Sporophora usque ad 700μ lata, alba, villosa, in vivo cupulata, in sicco globosa. *Hypharum systema* monomiticum. Hyphae generatoriae 2·5μ diam., hyalinae, septatae, fibulatae, ramosae, muris tenuibus. Superficies exterior pilis rigidis, hyalinis vestita. Pili usque ad 150μ longi, 2·5–3μ lati, granulis incrustati, continui, muris tenuibus, apice filiformes. *Basidia* clavata, quadrispora, 23·4–41·6 × 5·5–6·5μ. *Sporae* 8–10 × 5–6·5μ, latae ellipsoideae. Fig. 3/1, p. 270.

Habitat: on gall of *Polylepis sericea*, Laguna Negra, Sierra de Santo Domingo, Edo Mérida, 3440 m., 27 July 1958, *Dennis* 1809, type, *Dennis* 1809A.

Fructifications scattered, white, villose, cupulate becoming globular when dry. On soaking the material in 10% potassium hydroxide solution and gum arabic prior to sectioning and then mounting the sections obtained in aniline blue in lactic acid the sections open out rapidly and become very shallowly discoid in profile. This may or may not represent the normal shape of the living fruitbodies, but when expanded in this way the sections indicate that the fructifications are up to 700μ in width. When dry the margin of the cup becomes strongly enrolled and covers the hymenium leaving only a small central pore. *Hyphal structure* monomitic, consisting of thin-walled generative hyphae, 2·5μ in diam., with clamp-connexions at the septa. The fruitbodies are very delicate, consisting of a layer of basidia, 15·6μ wide, lining the inside of the cup, followed by the flesh which is reduced to only one or two hyphae in thickness, except in the region of the rudimentary stipe-like base, and finally by the hairs covering the outer surface. The hairs which are densely covered by detersile rod-shaped crystals are divergent and it is impossible to include them in measurements relating to the thickness of the fructifications. These hairs up to 150μ long and 2·5–3μ wide have slightly thickened walls which thin out toward the strongly tapering whip-like apex and also toward the base which may also be somewhat narrowed. *Basidia* 4-spored, clavate, 23·4–41·6 × 5·5–6·5μ. The basidia, which when mature protrude above the hymenial surface, have long tapering bases which curve round parallel to the sides of the fruitbody. *Spores* 8–10 × 5–6·5μ, broadly elliptical to pip-shaped with prominent apiculus.

Henningsomyces *Kuntze*

Fructifications scattered or densely gregarious, white or yellow, tubular or somewhat barrel-shaped, sessile, appearing glabrous to the eye but clothed

FIG. 3

with inconspicuous forked hairs toward the apex. *Hyphal structure* monomitic, consisting of thin-walled, narrow, branched, generative hyphae which usually bear clamp-connexions at the septa. The hyphae are often indistinct and when fruitbodies of certain species [*H. candidus* (Pers.) Kuntze] are mounted in potassium hydroxide solution the presence of copious oleaginous droplets in the flesh makes microscopic examination difficult. *Cystidia* and *Gloeocystidia* absent. *Basidia* 2–4-spored, small up to 24 × 7μ. *Spores* smooth, hyaline, nonamyloid, broadly elliptical, ovate or subglobose.

Henningsomyces minimus (*Cooke & Phil.*) *Kuntze.*

var. **venezuelae** *Reid*, var. nov. a var. *minimo* sporis majoribus 4·75 7 × 3·5–4·5μ differt.

Habitat: on dead bark in cloud-forest, El Avila, Dto. Federal, 2000 m., 17 June 1958, *Dennis* 1228, type.

Fructifications minute, up to 300μ high, 200μ wide, scattered or gregarious in small colonies, pure white becoming buff on drying, subcylindric to barrel-shaped, but narrowing at the extreme base. In herbarium material some of the fruitbodies have a well defined apical pore-like opening but in many others this opening appears as if it had been pinched closed. *Hyphal structure* monomitic, consisting of indistinct, narrow, branched, generative hyphae 2–3μ in diam. These hyphae have thin or very slightly thickened walls and appear to lack clamp connexions at the septa. The latter character is, however, difficult to verify. The fruitbodies are delicate and very brittle when dry, consisting of a layer of basidia 13–15μ in width lining the interior, followed by the flesh which is 15–18μ in thickness. The outer surface of the fructification is glabrous except toward the extreme apex where the hyphal endings become variously forked and appear to grade into the basidia. *Basidia* 12–15 × 5–6μ, subcylindric or clavate, with 2 or 4-sterigmata. *Spores* 4·75–7 × 3·5–4·5μ, elliptical, broadly elliptical or ovate. Fig. 3/5, p. 270.

Talbot (1956) has redescribed *H. minimus*, following examination of type material preserved in the Kew Herbarium and also in the National Herbarium at Pretoria and has noted that the spores are 'subglobose to broad-ovate, 2·5–3 × 3–4μ'. He also stated that the hyphae were 'rather indistinct about 1·6μ diam.' and added that no clamps were seen. Furthermore he indicated that he failed to find surface hairs on the fruitbodies. Examination of the Kew collection has shown it to be sterile and in poor condition; the hyphae are indistinct and it has not been possible to demonstrate the presence of surface hairs.

The Venezuelan material would therefore seem to differ from the type gathering which it closely matches macroscopically, in its larger spores and in the presence of surface hairs. Even so it must be remembered that the spores described by Talbot may have been immature and that failure to

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Fig. 3. 1. *Flagelloscypha polylepidis*, (a) spores, (b) basidia, (c) hairs. 2. *Cyphellopsis subglobispora*, (a) spores, (b) basidia, (c) hairs. 3. *Lachnella villosa* (as determined by Patouillard), (a) hairs, (b) basidia. 4. *Lachnella caracasana*, spores. 5. *Henningsomyces minimus* var. *venezuelae*, (a) basidium, (b) spores, (c) hairs. 6. *Lachnella subfalcispora*, (a) origin of hair arising from base of fruitbody, (b) origin of hair arising from just below the margin of fruitbody, (c) apices of hairs showing secondary septa, (d) hair distorted by treatment with 10 per cent potassium hydroxide, (e) spores. All × 830.

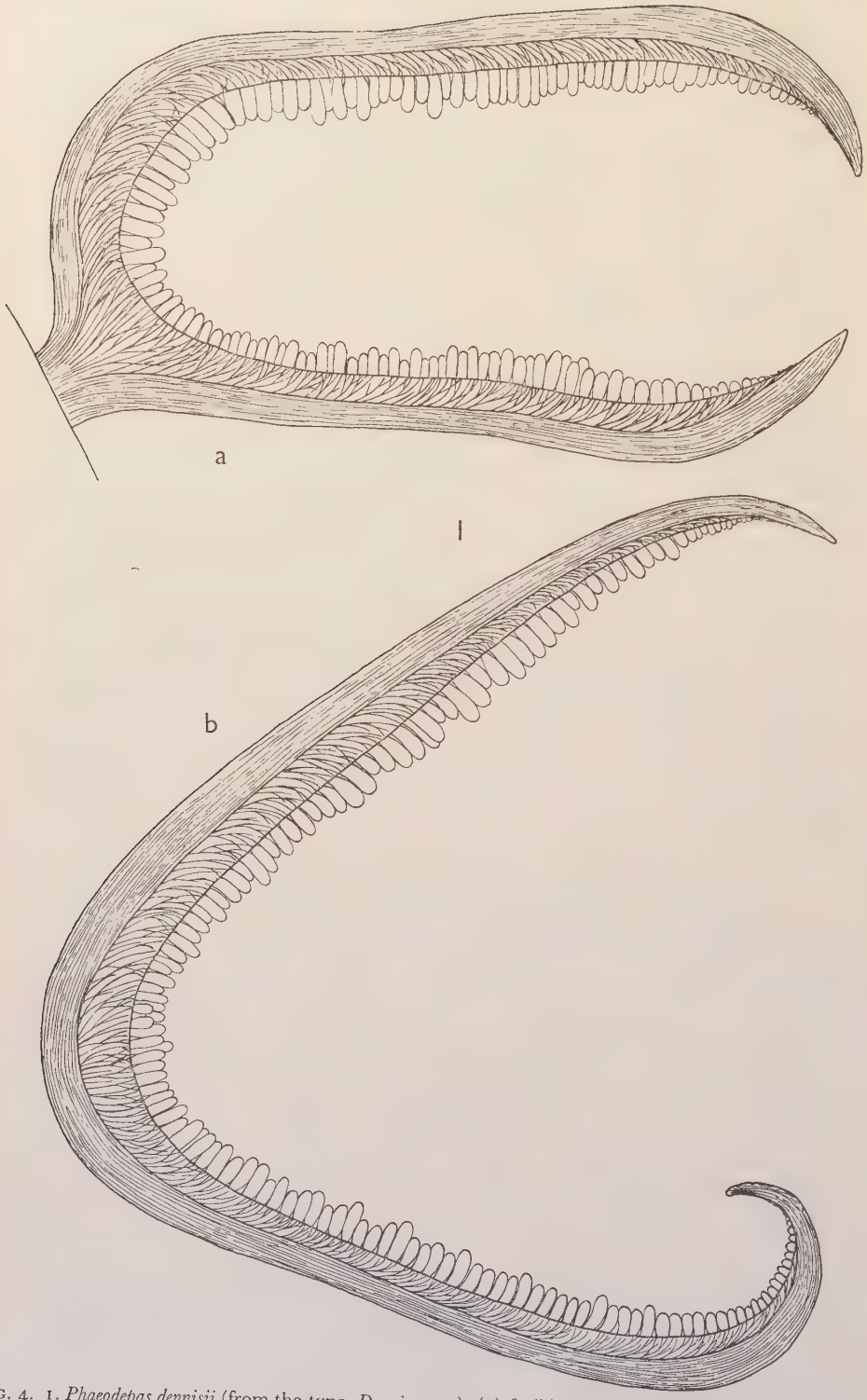

FIG. 4. 1. *Phaeodepas dennisii* (from the type, *Dennis* 1292), (a) & (b) sections through fruitbody, × 160.

observe surface hairs on the type does not necessarily mean that they are absent since they are often difficult to demonstrate on well preserved fruitbodies. However, microscopic investigation of further South African collections of *H. minimus* will no doubt eventually help to clarify the true status of the taxon described above.

Phaeodepas *Reid*, gen. nov.

Sporophora sparsa, pallido-brunnea, glabra, pendula, campanuliformia, breviter stipitata. *Hypharum systema* monomiticum. Hyphae generatoriae angustae, ramosae, septatae sine fibulis, muris tenuibus sed distinctis, brunneis sed basidia versus hyalinis. *Cystidia et gloeocystidia* absentia. *Basidia* quadrispora, hyalina, clavata. *Sporae* laeves, hyalinae, ellipsoideae.

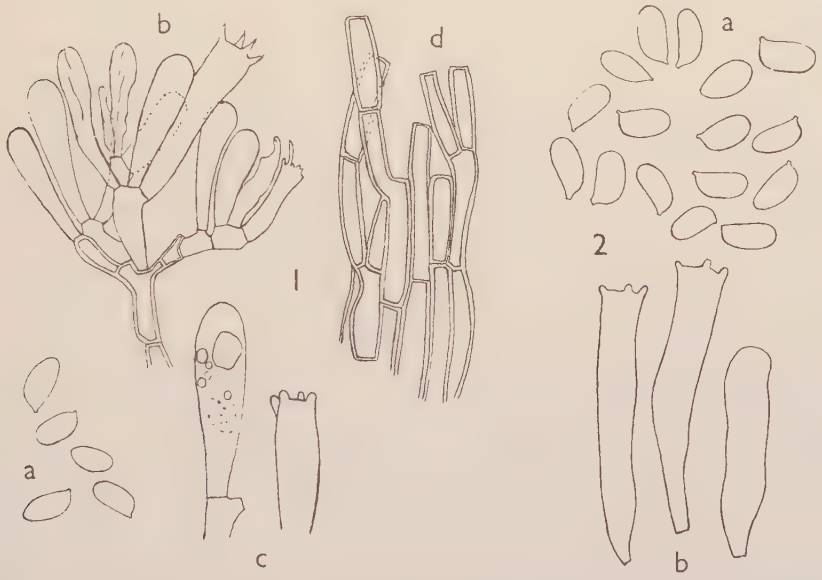

Fig. 5. 1. *Phaeodepas dennisii* (from the type, *Dennis* 1292), (a) spores, (b) group of basidia, (c) basidia, (d) hyphae forming surface of fruitbody. 2. *Phaeodepas dennisii* (from *Dennis* 1802), (a) spores, (b) basidia. All × 830.

Fructifications scattered, pale brown, glabrous, pendulous, bell-shaped, with a very short stipe. *Hyphal structure* monomitic, consisting of narrow, branched, generative hyphae which lack clamp-connexions at the septa. These hyphae have thin but distinct brown walls which become progressively paler in the subhymenial tissue until those hyphae bearing the basidia appear hyaline. *Cystidia* and *gloeocystidia* absent. *Basidia* 4-spored, hyaline clavate. *Spores* smooth, hyaline, elliptical.

Type species: *Phaeodepas dennisii* Reid.

Phaeodepas dennisii *Reid*, sp. nov.

Sporophora usque ad 830-2000μ alta, 350–1300μ lata, sparsa, campanuliformia, pendula, ochraceo-bubalina, hymeniis pallidis, glabra, longitudinaliter rugosa, stipite brevi. *Hypharum systema* monomiticum. Hyphae generatoriae 2·5–3(–4)μ diam., ramosae, septatae, sine fibulis, muris

tenuibus sed distinctis, brunneis sed basidia versus hyalinis. *Basidia* quadrispora, hyalina, clavata, 27–31·6(–44) × 6–7μ. *Sporae* 7–10 × 3·75–4·5μ, hyalinae, ellipsoideae.

Habitat: on rotting grass beneath living growth, slopes of La Silla, above Los Palos Grandes (Caracas), Edo. Miranda, 26 June 1958, *Dennis* 1292, type; on dead fern-rachis (*Jamesonia* sp.) in forest, Laguna Negra, Sierra de Sto. Domingo, Edo. Mérida, 3440 m., 13 July 1958, *Dennis* 1802.

Fructifications 830–2000μ high, 350–1300μ wide, scattered, bell-shaped, ochraceous-buff, with pallid hymenia, glabrous but appearing roughened under a lens owing to irregular longitudinal wrinkling. The fruitbodies have a short stipe which is often obliquely curved so that they hang pendulously. *Hyphal system* monomitic, consisting of narrow, branched, generative hyphae, 2·5–3(–4)μ in diam., lacking clamp connexions at the septa which tend to be at frequent intervals (sometimes only 15μ apart). There is a well defined outer layer to the fructification up to 26μ in thickness, formed of more or less parallel branching hyphae with brown walls, but from the innermost of these hyphae others arise which curve away at right angles to form a distinct subhymenial tissue, 52μ in thickness at the base of the fruitbody but thinning out toward the apex where it practically disappears. The hyphae of the subhymenial tissue have rather pale brown walls which become progressively paler toward the hymenium until those bearing the basidia appear hyaline. *Basidia* 27–31·6 (–44) × 6–7μ [up to 9μ in width when immature], hyaline clavate, with 4 sterigmata. *Spores* 7–10 × 3·75–4·5μ, hyaline, elliptical. Fig. 4, p. 272; 5, p. 273.

It should be noted that *Dennis* 1802 has slightly larger spores (7·5–10 × 3·75–4·5μ) than the type collection (7–8 × 3·75–4μ), has slightly longer basidia up to 44μ in length, and the external hyphae are slightly paler in colour and are frequently more constricted at the septa.

The following species are of uncertain affinity and have therefore been assigned to the genus '*Cyphella* sensu lato':—

Cyphella coralloderma *Reid*, sp. nov.

Sporophora circa 500μ alta, 500μ lata, sparsa, tenera, pendula, alba, cupulata, stipite brevi. Cupula per sinum medium in duabus partibus divisa. *Hypharum systema* monomiticum. Hyphae generatoriae 2–3μ diam., obscurae, hyalinae, ramosae, muris tenuibus, septatae, probabiliter fibulatae. Superficies exterior hyphis coralloideis vestita. *Basidia* 22–33·8 × 7·5–8μ quadrispora, subclavata vel subcylindrica. *Sporae* 8·75–11·5 × 3·75–5μ, hyalinae, ellipsoideae.

Habitat: at base of grass-culms (*Valota insularis*), Guatopo, along the road to Aragüita, Edo. Miranda, 800 m. 25 June 1958, *Dennis* 1197, type.

Fructifications about 500μ high and 500μ wide, scattered, delicate, pendulous, white, with a short but distinct stipe. The cupulate fruitbody must either be more or less completely divided into two by a thin deep median fold or else it must consist of a stalk bearing two distinct cups intimately fused one with the other. Although it has not been possible to ascertain which of these two alternatives is the correct interpretation since the material is scanty, the former would seem to be the more likely. *Hyphal structure* monomitic, consist-

ing of rather indistinct thin-walled, hyaline, branched, generative hyphae 2–3μ in diam., which appear to bear clamp-connexions at the septa [not confirmed with absolute certainty]. The fruitbody consists of an outer 'layer' of very narrow, highly branched coralloid hyphae, followed by a zone 6–8μ wide composed of ordinary thin-walled hyphae, and finally by the hymenium. *Cystidia* and *Gloeocystidia*: there are sterile elements present on the margin of the fructification which seem to grade into the basidia. These bodies, which are up to 4·75μ wide, narrow somewhat toward the apex before expanding into a more or less distinct head. They may also develop a lateral branch toward the apex. *Basidia* 22–33·8 × 7·5–8μ [up to 10μ wide when immature], varying from subclavate to subcylindrical with 4 prominent sterigmata up to 7·5μ in length. *Spores* 8·75–11·5 × 3·75–5μ, hyaline, elliptical, with an oblique apiculus. Fig. 1/4, p. 262; 2/4, p. 264.

Cyphella mauritiae *Pat. & Gaill.* in Bull. Soc. mycol. Fr. 4: 40 (1888).

This species was described as follows:—

'Entièrement blanche, très mince, diaphane, en forme de cône renversé, glabre, stipe très court, villeux à la base, marge entière sinueuse.

Eparse sur les pétioles pourrissants de *Mauritia flexuosa*. Puerto-Zamuro. Mai (no. 20).

Obs.—Inéquilatérale, conique; pendante, longue de 4–5 millimètres; atténué en un stipe court, obtus, courbé. Hyménium lisse. Basides claviformes, (23–30μ) à 4 stérigmates.'

Unfortunately the type-material which is preserved in the Farlow Herbarium consists of only 3 sporophores, and it was decided that this occasion did not merit the risk during microscopic examination of possible damage to the collection. All that can be stated is that the largest fruitbody in the dried condition is approximately 3 mm. long and 2 mm. wide and deeply funnel-shaped with a short, inconspicuous stipe. There do not appear to be any surface hairs, although this could not be established with absolute certainty. The hyphae, however, are mostly very markedly inflated, reaching 20·8μ in diam. They are thin-walled, hyaline, branched, and bear clamp-connexions at the septa. Fig. 1/2, p. 262.

It is very probable that *Cyphella mauritiae* will prove to be a species of *Calyptella*.

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Melchior Treub (1851–1910).*—Those who have visited the Botanic Gardens at Bogor will know the impressive Treub Laboratory and the pleasant Treub House in which hospitality is now offered to guests of the Gardens. With the publication of Dr. Zeijlstra's biography of Treub (written in English), we now have the opportunity to learn fully of Treub's career and achievements, which have led to the commemoration of his name in these buildings.

After a hard-working period as a student, Treub was rewarded with the appointment as Director of the Botanic Gardens in Buitenzorg (as Bogor was then called) at the early age of 29. Dr. Zeijlstra provides a historical sketch of the institution up to the time of Treub's arrival and presents a picture of neglect in the Herbarium and Library as Treub found it on his arrival in 1880. Treub did a great deal to expand the activities of the institution and to improve amenities. He encouraged visits by foreign botanists in order for them to study diverse topics and thus he initiated a tradition which has made the Bogor Gardens internationally famous and which continues at the present time under Indonesian auspices. A laboratory specially set aside for visitors was opened in 1885. Treub was responsible for the formation of the 'Buitenzorg Fund' which enabled Dutch botanists to study in the Bogor Gardens and associated departments. Taxonomic research on the Malaysian flora was encouraged by Treub, resulting in the works of Boerlage, Koorders and Backer. Credit is also due to Treub for an increase in plant-collecting expeditions to islands such as Borneo and New Guinea.

Apart from administration, Treub found time to investigate diverse topics himself including various embryological problems, the pitchers of *Dischidia rafflesiana*, starch grains in *Euphorbia* latex, climbing plants, and the presence of HCN in tropical plants. In 1883 the devastating eruption of Krakatau took place. Treub visited the island 3 years later to examine the process of recolonisation.

Although the value of plantation-crops played such a large part in the economy of the Netherlands Indies, there was surprisingly no Department of Agriculture in the country to deal with agricultural problems. The government relied on the Director of the Botanic Gardens for advice in such matters. In this way, the Gardens had to cope with applied research for the benefit of planters who, in fact, subsidised part of this research. Treub actively pressed the government to set up a Department of Agriculture and eventually in 1904 his efforts succeeded and he was appointed as Director.

Dr. Zeijlstra presents Treub's career with a mass of detail that at times tends to obscure the more important features. The English runs smoothly, but very occasionally there are lapses into 'Dutch-English' resulting in quaint expressions such as 'sprankling intellect' (p. 110). These small criticisms apart, this biography is a fitting tribute to a man of considerable determination and achievement who performed much in the service of Malaysian botany and the great institution forming the Bogor Botanic Gardens.

L. L. Forman

* *Melchior Treub*. By H. H. Zeijlstra. Pp. 128, 13 half-tone plates (16 photographs), 2 text figs. Amsterdam: Koninklijk Instituut voor de Tropen, 1959. Price 7 Dutch florins.

Notes on African *Sapotaceae*: III*

J. H. Hemsley

THE GENERA ANINGERIA, MALACANTHA, AND BUTYROSPERMUM IN EAST AFRICA.

Aningeria Aubrév. & Pell.

As a result of the activities of several plant collectors, knowledge and understanding of the genus *Aningeria* in East Africa has built up impressively over the last two decades. *Aningeria altissima* (A. Chev.) Aubrév. & Pell. has been recognised as a frequent tree in the Uganda forests which occurs also along the western borders of Tanganyika and Kenya. Material has been described under *Pouteria giordani* Chiov. in Atti R. Accad. Ital. 11: 43 (1940) from the forests of SW. Ethiopia which may now be referred to *A. altissima*. The holotype specimen, *Giordano* 2455, kindly loaned by the Florence Herbarium, is in excellent agreement with the Uganda material and clearly represents a north-eastwards extension of the species range. *Aningeria altissima* is known too from riverine forests in the southern Sudan Republic and hence the distributional pattern of a West African forest tree reaching its eastern limits in East Africa and SW. Ethiopia would now seem reasonably well established.

Mr. H. C. Dawkins of the Uganda Forest Department, in a personal communication, has provided the following note concerning the availability in Uganda—'Vast resources of *A. altissima* and *Chrysophyllum albidum* occur, as both regenerate freely and show normal size-frequency curves in their own areas. The pair of them, with *Celtis* and *Cynometra*, would entirely dominate our 3000–4000 ft. [900 m.–1200 m.] forests . . .'

A second species now known to be widely distributed in the montane forests of East Africa is *A. adolfi-friederici* (Engl.) Robyns & Gilbert. The species, first described by Engler (in Wiss. Ergebn. Deutsch. Zentr.-Afr. Exp., 1907–1908, 2: 519 (1913)), was placed tentatively within the genus *Sideroxylon*, a series of Mildbraed gatherings from Ruanda and the Ruwenzori area being cited by the author. A good plate of the species is provided, which, in conjunction with the description and a specimen at Kew (*Lebrun* 4484 from the Ruwenzori area), has been used in the absence of type-material destroyed at Berlin. The species has been known to the Kenya Forest Department for many years under the Kikuyu name 'MUNA' and general gatherings were obtained from Mt. Kenya, Aberdare Mts. and the escarpment forests. It appears in Battiscombe, Cat. Trees Kenya Col.: 32 (1926) as a *Cola* species and a photograph of a large characteristic solitary specimen standing in a previously afforested area is given on p. 33 of this publication. The error is rectified in Dale, Trees & Shrubs of Kenya Col.: 120 (1936) where for the first time the name *Sideroxylon adolfi-friederici* is associated with Kenya material. It was not until Robyns & Gilbert (in the Fl. Parc Nat. Albert 2: 43 (1947)) proposed the new combination under *Aningeria* that the present taxon was linked with the genus and there exists

*Continued from Kew Bull. 14: 309 (1960).

little doubt that it falls naturally into place along with several other African *Aningeria* species.

Probably of widespread occurrence in the montane forests of East Africa, *A. adolfi-friederici* has of latter years been collected from Ethiopia, from several localities in Tanganyika and also from Northern Rhodesia. A study of the range of material available leads to the conclusion that, as is the case in some other strictly montane elements, a divergence of characters under conditions of isolation may be in progress. Thus it is possible to recognise several distinct end-points within the species-plexus. For example, material from the W. Usambara Mts. and from the Rungwe highlands in southern Tanganyika is so strikingly different at first sight that it may be thought to involve specific distinction.

Examination of mature leaf-material has shown there to be a wide range of variability in characters of shape and size of leaf and also in the density and quality of indumentum. Position on the tree may influence greatly these characters and the factor of leaf-age must also be taken into consideration. Furthermore, the appearance of the sapling leaves has proved very deceptive. That the same species is capable of producing the small elliptic crown-leaves with margins conspicuously inrolled, lower leaf-surface covered with a dense uniform orange-brown velutinous indumentum and also the large obovate-elliptic or elliptic-oblong sapling-leaves with no inrolling and with a scattered ferrugineous puberulence, has been a difficult fact to accept. The sapling-leaves closly resemble mature leaves of *Malacantha alnifolia* and the smaller ones may be confused with mature leaves of *Aningeria robusta*. There is also close superficial resemblance between them and sapling leaves of *A. altissima*. Mr. H. C. Dawkins writes 'the seedlings [of *A. adolfi-friederici*] are quite indistinguishable in the field from those of *A. altissima* (sensu Ind. Trees Uganda); for a long time we used to confuse them until it was discovered that the two species very rarely occur together'. The repeated collection of specimens bearing larger sapling leaves from areas in which *A. adolfi-friederici* is known to occur, e.g. Mt. Elgon, the SW. Ethiopian forests, the W. Usambara Mts., has provided the main source of evidence for regarding them as such. The opinion of Mr. H. C. Dawkins, who in correspondence refers to the specimen *Brown in Eggeling* 3822, from Mt. Elgon, which is available at Kew, saying 'These are quite obviously collected off coppice shoots or saplings and are grossly atypical; I feel certain that they are genuine (*A. adolfi-friederici*) in spite of that', strengthens the case considerably.

More recently, material has been received from Ethiopia, near Soyuma, in a gathering (*Mooney* 5732) which settles the matter conclusively. The large leaves are in excellent agreement with those of *Giordano* 2478 (a syntype of *Pouteria rufinervis* Chiov.), but the collector notes 'leaves taken from a sapling'. Clearly a broad interpretation of leaf-character is necessary in dealing with the species and the present author in advancing the following proposals has borne in mind the very close similarity in appearance of the mature tree from say the W. Usambara montane forests and from the Kenya forests. It seems advisable to treat the taxon as a species in a wider sense and to regard the segregates as subspecies, some of which at least may be looked upon as having evolved sufficiently far along distinct lines to represent species in the making under conditions of geographical and environmental isolation.

Specimens from the type area may be matched with a series of gatherings

from the western and northern parts of East Africa, appearing to fall into one reasonably well-defined group. This would include specimens from the Imatong Mts., Mt. Elgon, west Kenya highlands and Ethiopia, all agreeing in the elliptic to elliptic-oblong leaves with lengths of 2½ 3 times the width of the blade. The margin varies from inrolled and ± undulate to revolute with the under surface covered with a dense orange-brown or ferrugineous velutinous indumentum which on occasion may wear away or age in older leaves to a greyish or greyish-brown colour. The primary lateral nerves are of the order of 13–20 in number with the majority falling within the 14–18 range.

Into this group, which becomes the type subspecies, subsp. **adolfi-friederici,** are placed two species published by Chiovenda in Atti R. Accad. Ital. 11: 42 & 44 (1940) from Ethiopia, *Pouteria ferruginea* and *P. rufinervis*. I have been able to examine the type-material of both and there is no doubt that they represent varying states of the major taxon under discussion. *Capuano* 2530 (a syntype specimen of *P. ferruginea*) is from the extreme crown of the tree showing the thick coriaceous inrolled leaves with ferrugineous indumentum. *Giordano* 2447 (another syntype of the same 'species') shows somewhat larger leaves, with no tendency to inroll on the margins and with the paler brown indumentum. *Giordano* 2478 (a syntype of *P. rufinervis*) has two twigs bearing large elliptic-oblong or elliptic-obovate leaves, comparing well with material of similar age from Mt. Elgon. The description given by Chiovenda is founded almost entirely upon leaf-characters, flowers and fruits not being mentioned. The 'species', *P. rufinervis*, is concluded to have been based upon a gathering of sapling leaves of *A. adolfi-friederici*.

Dealing with material from Mt. Kenya and the Aberdare Mts., a distinct change in the dimensions and general appearance of the leaves is to be noted. These are on the whole smaller than in the subsp. *adolfi-friederici* and usually range between 4–12 cm. long, the majority falling within the 5–8 cm. length group. The margins are nearly always strongly curled and inrolled laterally with the lamina itself usually curved along the midrib. The indumentum presents much the same appearance as in the previous taxon but the lateral nerves are fewer in number and range from about 10–15, the majority of leaves having 12–14 nerves. Coupled with smaller leaves is a tendency to produce smaller flowers which have less robust pedicels and calyx and a proportionately shorter style.

R. E. Fries (in Not. Bot. Gart. Berl. 9: 332 (1925)) has published a name for the Kenya taxon, *Sideroxylon adolfi-friederici* subsp. *keniensis*, based on the specimen *R. E. & T. C. E. Fries* 2059. In the original description the author uses the characters of shorter petiole, broader lamina, conspicuously revolute leaf-margin and the fewer (12–13) and more laxly arranged lateral nerves to differentiate his subspecies. These characters hold good if it is understood that by a broader lamina, the lamina is broader in relation to its length than subsp. *adolfi-friederici*, hence giving a smaller value for the length : breadth ratio. A duplicate of the type, available at Kew, has been examined and is clearly representative of the small-leaved Kenya material. The epithet given by Fries is accepted for the present taxon, which becomes **Aningeria adolfi-friederici** (*Engl.*) *Robyns & Gilbert* subsp. **keniensis** (*R. E. Fries*) *J. H. Hemsl.*, comb. nov.

A single gathering (*Hitchcock* 3), consisting of three sheets, obtained from

Oldeani Mt., Mbulu District, is unique in appearance and does not match up with anything so far available in herbaria. There can however be little doubt that it is the local representative of *A. adolfi-friederici* upon this isolated volcanic block.

In overall leaf-facies it agrees with material from Ruwenzori but the indumentum is much denser with the constituent hairs longer, imparting a woolly appearance to the midrib and lateral nerves of the lower surface not found elsewhere in the species. It is upon the pedicels and calyx however that the main differences occur for these structures are covered with a very dense woolly indumentum, the individual hairs being relatively long and tangled, contrasting markedly with the shorter hairs and velutinous covering in other specimens. Flowers of the Oldeani tree are large, the largest found in the species, exceeding those of the subsp. *adolfi-friederici* in size. The sepals are elliptic-oblong in shape and are longer and narrower than the elliptic-ovate or obovate shapes of other taxa. Fruits have yet to be seen.

It is proposed to recognize this taxon to be subspecifically distinct and the following new name is created for it.

Aningeria adolfi-friederici (*Engl.*) *Robyns & Gilbert* subsp. **floccosa** *J. H. Hemsl.*, subsp. nov.

Laminae foliorum maturorum ellipticae usque oblongo-ellipticae, 11–17 cm. longae, 4–6·5 cm. latae, subtus ubique dense ferrugineo-velutinae, marginibus haud vel leviter revolutis. Pedicelli et calyces indumento floccoso pallide brunneo dense vestiti.

Tanganyika. Mbulu District, Oldeani, above Mr. Major's Farm, 3000–3140 m., 'used for timber', 23 Mar. 1950, *Hitchcock* 3 (K, holotype!, EA, isotype!).

Material collected by *J. Proctor* and by *Drummond & Hemsley* in 1953 from the Shagai Forest, W. Usambara Mts. has enabled recognition of a further taxon from this region. The material deviates rather widely in certain characters from taxa previously discussed but in others appears sufficiently close to be regarded as part of the major taxon under consideration.

The main differences in appearance are due to the density and distribution of indumentum. In *Drummond & Hemsley* 2592A, a gathering chosen to demonstrate a range in shape, size and indumentum of the leaves, the ferrugineous felted appearance of the leaf lower surface is confined to the very youngest of the crown-leaves only. Older crown-leaves, in common with shade leaves from lower levels of the tree, have a dark brownish pubescence consisting of small spreading hairs which in leaves from an epicormic shoot are very reduced in number, the under surface becoming ± glabrous. The actual leaf-shape is in reasonable agreement with other taxa, the form varying as before from leaves with margins strongly inrolled and the lamina curved to that in which there is little or no inrolling and a slightly undulate margin. The main difference between the present gathering and all other specimens lies in the markedly decurrent base of the lamina but this development is perhaps foreshadowed in some of the leaves of material from Mt. Kenya where a slight suggestion of the decurrent condition appears. Pedicels and calyx show a similar lack of indumentum and are covered with small scattered hairs, lacking completely the red-brown felted appearance of other

taxa and are grey-green in colour when living. Another gathering (*Markham* 987) from the Baga Forest, W. Usambara Mts., received from the East African Herbarium, probably represents the extreme form of sucker- or sapling-leaves of the present taxon. The tendency for the leaves to become much longer and to develop an elliptic-obovate or oblong-obovate shape found in the Mt. Elgon and Ethiopia sapling material is again demonstrated in this instance. The lack of indumentum is carried to the extreme, the leaves being totally glabrous on the lamina, leaving a few hairs only along the lower midrib.

It is proposed to regard the Usambara taxon as subspecifically distinct and the following name is given to it.

Aningeria adolfi-friederici (*Engl.*) *Robyns & Gilbert* subsp. **usambarensis** *J. H. Hemsl.*, subsp. nov.

Verticis arboris laminae juveniles necnon ramuli juveniles indumento denso ferrugineo vestiti. Laminae foliorum maturorum anguste usque late ellipticae, 6–13 cm. longae, 2·5–4·0 cm. latae, subtus serius virescentes pilis parvis patentibus praesertim in costa nervisque vestitae, basi in petiolum decurrentes, marginibus plerumque revolutis; folia epicormica glabrescentia. Pedicelli ± pubescentes. Calyces sub anthesi pilis minutis ± dissitis puberuli.

Tanganyika. Lushoto District: W. Usambara Mts., Shagai Forest nr. Sunga, 'tall tree, height 25 m., leaves variable in size and indumentum, sometimes pale green on underside, others from topmost branches with red-brown indumentum. Calyx grey-green, petals cream, filaments cream, anthers brown, style green', 17 May 1953, *Drummond & Hemsley* 2592A (K, holotype!, EA, isotype!).

Another taxon with a very distinctive facies is represented in the Kew Herbarium by a gathering, *Semsei* 1532 from the Rungwe Forest Reserve, Southern Highlands, Tanganyika. The material bears abundant flowers and to it can be added sterile material, *Nightingale* s.n., from the Livingstone Range, June 1951, and a leafy shoot from a sapling, *F. White* 2764 from Kangampande Mt., Nyika Plateau, Northern Rhodesia. Semsei's gathering shows a most interesting range of leaf-shape, appearance of lateral nerves and indumentum. From this material the main tendency would appear to be retention of the juvenile form by the adult and mature leaves, which are large and mostly between 12–20 cm. long, varying in shape from elliptic to elliptic-obovate. The number of lateral nerves is of the higher order and ranges from 18 to 24, the spacing varying from a lax arrangement with intervals of 1 cm. or more, to a closer arrangement with distances of about half of this figure. In general appearance the undersurfaces of the latter leaves bear striking resemblance with those of the West African species *A. robusta* (A. Chev.) Aubrév. & Pell. Another feature of the Semsei gathering lies in its indumentum characters. There is a medium to dense covering of ferrugineous hairs in the younger leaves which may be compared with the general condition found in Ruwenzori material but is a little less dense. In older leaves this strips away in irregular patches and eventually the undersurface assumes a dark green colour and is ± glabrous except along midrib and nerves. The sapling-leaves vary in shape from narrowly elliptic to narrowly oblanceolate, and resemble the older adult leaves in the char-

acters of the lower surface. Compared with the corresponding sapling-leaves of the other subspecies they are narrower in relation to their length. Flowers do not appear to differ significantly from those of other taxa. The indumentum on the calyx and pedicels varies from brown to a greyish brown colour but compares very favourably with that of *Eggeling* 3996 from Bwamba Pass, Ruwenzori. The taxon is to be regarded as the representative of the species in the southern part of the range in the montane forests of the Southern Highlands of Tanganyika and the Nyasaland/Northern Rhodesian borderlands and the following subspecific rank is proposed.

Aningeria adolfi-friederici (*Engl.*) *Robyns & Gilbert* subsp. **australis** *J. H. Hemsl.*, subsp. nov.

Laminae foliorum maturorum ellipticae usque obovato-ellipticae, plerumque 12–20 cm. longae, 5–8·5 cm. latae, subtus indumento ± denso ferrugineo serius irregulariter sed laminatim delapso vestitae, tandem glabrescentes, pilis praesertim in costa et nervis lateralibus, marginibus haud revolutis. Pedicelli et calyces indumento denso brunneo tomentello pilorum brevium composito vestiti.

Tanganyika. Southern Highlands Province, Rungwe Forest Reserve, 'tall tree, flowers yellow', Jan. 1954, *Semsei* 1532 (K, holotype!, EA, isotype!).

One gathering (*Lindeman* 866) obtained from the comparatively low altitude of 1400 m. at Themi River, Arusha, remains to be accounted for. The leaves of the specimen would seem to come nearest those of the subsp. *keniensis* and it is perhaps of some significance that they match up closest with those of *Young* 1063 from Meru on the lower slopes of Mt. Kenya. The Meru forests are noteworthy for the presence of several lowland rain-forest trees, e.g. *Cylicomorpha parviflora*, and represent a type of forest growing under more favourable climatic conditions than the strictly montane forest upon the higher slopes of Mt. Kenya. Thus both gatherings are from the lowermost levels of montane forest, probably in riverine forest. It is tentatively suggested that they represent a lush form of the above subspecies, the leaves reaching the maximum size for the adult state of the subspecies, possessing a short broad form of lamina with a broadly rounded to almost square base.

Flowers of the Lindeman specimen would appear to have an unusually long corolla-tube, exceeding the length of the calyx and carrying the corolla-lobes above the general level of the latter. This character is again perhaps reflective of the environment and may be regarded as a development correlated with the low-altitude of the habitat.

Two gatherings of an *Aningeria* species obtained within latter years from the coastal districts of Tanganyika (*Faulkner* 729 from Bushiri, Pangani District: and *Semsei* 740 from the Kimboza Forest Reserve, Morogoro District) represent an undescribed new species for East Africa. The species is unique among the *Sapotaceae* of this area in its possession of a raceme-like inflorescence in place of the normal axillary fascicle of flowers. The inflorescence appears to be a specialized leafless shoot apparently of limited growth, occurring in the current leaf-axils and bearing fascicles or sometimes solitary flowers at intervals along its length, which appears in other species of the genus only as a rare variant along with the normal axillary fascicle. It has been noted thus in *A. adolfi-friederici* and *A. altissima* but in both such cases bearing smaller but otherwise typical foliage leaves. In the present taxon

the leaves are replaced by small ± subulate bracts. Fruiting material of the species has yet to be collected and the fate of the shoots is at present unknown.

Two further sterile specimens from the E. Usambara Mts. (*Flamwell* H87 and *Czurn* B22) represent sucker or sapling foliage of the species. The former collector notes the plant to be fairly common in rain-forest, Kiuhuhui, but no adult material has been seen from the locality.

A description of the species follows.

Aningeria pseudoracemosa *J. H. Hemsl.*, spec. nov.

Arbor usque ad 20 m. alta, cortice laevi, griseo vel griseo-brunneo. Alabastra terminalia ramuli juveniles et petioli indumento denso ferrugineo vestiti, ramuli vetustiores glabri, cortice atropurpureo brunneo, lenticellis parvis pallidis prominulis notato. *Petioli* 5–12 mm. longi. *Laminae* foliorum maturorum ellipticae usque obovato ellipticae, plerumque 8-17 cm. longae et 4–7·6 cm. latae (sed juveniles usque ad 27·5 cm. longae et 9·0 cm. latae), pellucide punctatae, apice rotundatae vel rarius subacutae, basi rotundatae usque late cuneatae, supra glabrae costa impressa nervis leviter impressis, subtus juventute pilis pallidis ramosis ± dissitis usque densiusculis molliter pubescentes, costa nervisque indumento ± ferrugineo et densiore vestitis, serius sicut juveniles puberulae usque glabrescentes, marginibus leviter vel conspicue revolutis; nervi laterales utroque latere costae subtus prominentis 14–20 (usque ad 26 in foliis juvenilibus), adscendentes, arcuatim prope marginem accurrentes, venis obliquis. *Inflorescentiae* racemiformes, floribus secundum ramulum brevum axillarem ± erectum vel cernuum fasciculatis, rhachide usque ad 8 cm. longo, indumento denso ferrugineo vestito, partibus rhachidis juvenilibus bracteis pedicellis alabastris florum pilis floccosis pallide brunneis usque ferrugineis dense indutis. *Bracteae* subulatae usque anguste ovatae, usque ad 4 mm. longae. *Pedicelli* 1–5 mm. longi. *Sepala* 5, usque ad basin libera, exteriora ± ovata usque elliptica, interiora angustiora et nonnunquam ± oblanceolata, 4·5–6 mm. longa, 2–3 mm. lata. *Corollae* tubus angustus, 4·5–5·5 mm. longus, circiter 3 mm. diametro, glaber; lobi 5, rotundati vel subtruncati, usque ad 2 mm. longi, ciliati. *Filamenta* cum tubo corollae ad dimidium saltem longitudinis tubi connata, partibus filamentorum liberis 1·0-1·5 mm. longis; antherae ± obcordatae, usque ad 1·5 mm. longae, apiculatae, lateraliter dehiscentes. *Staminodia* ± subulata usque anguste oblonga vel ± spathulata, 1–1·5 mm. longa, marginibus ciliatis. *Ovarium* subconicum, usque ad 2 mm. diametro, pilis erectis dense indutum; stylus 5–8 mm. longus, glaber; stigma 5-papillatum. *Ovarium* 5-loculare, ovulis solitariis medifixis. *Fructus* adhuc ignoti.

Tanganyika. Pangani District, Bushiri, 'a forest tree growing in shady situation. Flowers dull white and scented', 25 Oct. 1950, *Faulkner* 729 (K, holotype!, B, BR, EA, L, LISC, LMJ, S, all isotypes!); Morogoro District, Kimboza Forest Reserve, 'Tree to 60 ft., smooth grey bark, small greenish yellow flowers', July 1952, *Semsei* 740.

Malacantha Pierre

The genus *Malacantha* has been known in East Africa from a few areas in Tanganyika and Zanzibar under two named taxa but only in comparatively recent times has it been possible to link up representatives in West Africa.

The first species described from East Africa was placed in *Chrysophyllum* as *C. ferrugineo-tomentosum* Engl. (Engl., Bot. Jahrb. 28: 447 (1900)) and later transferred to *Malacantha* by the same author (Monogr. Afr. Pfl. 8: 48 (1904)). The types used were *Stuhlmann* 8720 and *Goetze* 338, both obtained within the vicinity of the Uluguru Mts. Specimens of neither have been seen but fortunately Engler provides an excellent plate of the species. A further species, *Malacantha sacleuxii*, was added by Lecomte (in Not. Syst. 4: 62 (1923)) based on a specimen *Sacleux* 1767 from Zanzibar.

A series of gatherings from the E. Usambara Mts. area were obtained by Zimmermann and others during the period 1905–1920 and these were correctly referred to *Malacantha ferrugineo-tomentosa* (Engl.) Engl. Of latter years specimens have been obtained from the Shimba Hills forest in Kenya, from the Nguru Mts. in Tanganyika and from Namagoa, Quilimane District, Portuguese East Africa, thus extending considerably the known range within the lowland regions of East Africa.

A comparison of material under the name *M. ferrugineo-tomentosa* from East Africa with specimens determined as *Malacantha alnifolia* (Bak.) Pierre from West Africa, suggests the two taxa to be closely related and subsequent investigation has proved there to be very little valid distinction between them. The range of material available from West Africa now makes it impossible to use the characters given by Engler in his key to *Malacantha* species which centred mainly on the occurrence and distribution of hairs on the leaf lower surface. Every gradation exists in West Africa between an almost glabrous surface with little or no indumentum on the midrib and nerves to one in which the surface is uniformly covered with erect hairs, the midrib and nerves becoming densely pubescent. This variability in indumentum covering is reflected in the young shoots, petioles, bracts and calyx, which similarly undergo a corresponding increase in the density and prominence of the hairs.

Some of the variability, but certainly not all, is due to the age and stage of development of the organs concerned, and the character is doubtless affected by environmental factors, too.

Of the species dealt with by Engler in his key it has been possible to examine authentic material of *M. heudelotiana* Pierre, *M. warneckeana* Engl. and *M. alnifolia* (Bak.) Pierre, all from West Africa, and the present author believes them to be referable to a single species. To these may be added *M. obtusa* C. H. Wright, the holotype gathering of which at Kew is an excellent match with a specimen of *Heudelot* 52, the type of *M. heudelotiana* Pierre. The earliest name for the West African plant is *M. alnifolia* (Bak.) Pierre and it is with this species that the East African material is to be compared.

In leaf-shape there is little difference. Engler's key separates *M. heudelotiana* from the East African *M. ferrugineo-tomentosa* by the leaves being longly obovate and two and a half times as long as broad in the former as opposed to obovate and little longer than broad in the latter. The characters given have proved unworkable, the leaf-shapes of some of the leaves of the gathering *Drummond & Hemsley* 4035 from the Shimba Hills, Kenya are in close agreement with those of the *Heudelot* type specimen from Gambia. Up to the present no glabrous or nearly glabrous specimens have been collected in East Africa and the material is fairly uniform in the appearance of the under

surface of the leaves. There is however a range in the density of the hairs, some specimens, particularly those from Zanzibar, show the presence of a very dense indumentum on the midrib and nerves with the petioles and young shoots clothed in long soft ferrugineous hairs. Other specimens can be found in which the density of indumentum matches that of some West African material, e.g. *Semsei* 866 from the Mtibwa Forest in the Nguru Mts. area matches *Foster* 37 from Lagos, the type of Wright's *M. obtusa*. In this pair it would be impossible to define any difference in the character of the indumentum. Concerning the Zanzibar material, *Sacleux* 1767 was the type-gathering of *M. sacleuxii* Lecomte, and the dense long erect hairs upon the young shoots and petioles were used originally to differentiate the species.

TABLE 1. Measurements (in mm.) of parts of flowers of some West and East African gatherings of *Malacantha alnifolia*.

Specimens from West Africa	Sepals l. × w.	Corolla-lobes l. × w.	Corolla-tube length	Filament length	Style length	Comment
Foster 37 ..	5·5 × 4·5	2·5 × 2·0	5·0	3·5	4·5	
Dalziel 8277	6·5 × 4·5	3·5 × 2·0	6·0	3·5	6·0	Old flowers
Kersting 236	5·5 × 3·3	2·0 × 2·3	6·0	3·5	5·5	
Keay in F.H.I 21096 ..	6·0 × 4·0	3·0 × 2·0	6·0	3·5	4·5	
Dalziel 192	6·0 × 5·0	2·5 × 2·0	6·0	1·5	9·0	No anthers. Unusually large style.
Elliot 51 ..	6·5 × 5·0	2·5 × 2·5	6·5	3·5	7·0	
Specimens from East Africa						
Sacleux 1767	5·0 × 3·0	1·5 × 1·5	3·5	—	3·0	? female flower
Faulkner 91	4·5 × 3·5	2·0 × 2·0	3·5	3·5	3·0	Anthers absent
Vaughan 1967	6·0 × 4·0	2·0 × 2·0	5·0	5·0	3·5	
Zimmermann 3062 ..		2·5 × 2·0	5·0	5·0	4·5	

Summing up the leaf-characters, there appears a tendency in West Africa for the leaves to be a little smaller and in general towards the glabrous condition than is the rule in East Africa. A considerable overlap occurs however, and several specimens from the west possess the dense brown pubescence on the midrib and nerves and cannot be separated with any degree of conviction from East African material.

Turning now to a consideration of the flower-characters, one of the more obvious differences is again that of the density of indumentum. In the East African specimens the bracts and calyx are covered with a dense ferrugineous indumentum which contrasts with the paler brown and frequently less densely arranged and shorter hairs of specimens from West Africa. This imparts to the buds and flowers of the latter a clean cut and less

woolly appearance. Table 1 sets out a series of measurements of flower parts of specimens from West and East Africa and shows those of the East African material to be a little smaller in lengths of corolla-tube and style. The dimensions given for sepals are taken from the largest one present in each flower. It is of interest to note that there appears to be a tendency towards sexual dimorphism, in two cases the anthers are missing and in a third the complete androecial whorl is absent. In one case the lack of anthers is coupled with an unusually long style. Another interesting variant has been observed in a flower from *Howes* 1070 from Ghana. In this specimen a small rudimentary stamen has been seen in the episepalous position, i.e. the position normally occupied by staminodes in genera bearing these structures, and is an addition to the full androecial complement.

The effect of the slightly longer corolla-tube of West African material is shown clearly in the latter gathering and is to be contrasted with the condition found in East African flowers where the corolla-tube is either almost or entirely contained within the sepals.

Finally dealing with the fruits and seeds, there is reasonable agreement in specimens from the two areas. From the rather scanty material available from East Africa it seems that the indumentum is a more conspicuous feature and would appear to persist on the fruit surface for a longer time. In both, the indumentum is probably largely rubbed away or shed before maturity. The seeds of *M. alnifolia* from West Africa are perhaps slightly narrower than those from the East, the latter being regarded as broadly elliptic, but this difference is only of very minor degree.

Having briefly run through a comparison of characters from the two areas, the life-form and habitats of the taxa concerned, as far as these are known, will be touched upon.

The species in East Africa is a deciduous tree of low altitudes and occurs both in lowland and riverine forest and seems to have fairly high water requirements. In the Mwele Mdogo forest, Shimba Hills, the leaves were taking on autumn tints and dropping in the middle of the dry season in late January and February 1953. In West Africa, *M. alnifolia* is noted to be a medium-sized tree of the mixed deciduous forest, fringes of closed rainforest and riverine forest and is said to be one of the more important colonizing species in some savannah areas. It is also reported as a small tree or even a shrub in gullies on dry rocky hillsides but as such is not known from East Africa.

In view of the evidence now available and the impossibility of formulating clear character differences between the two taxa it has been decided to treat the complex as one entity for which the name is *M. alnifolia* (Bak.) Pierre. Three sterile specimens from the Sudan Republic (*Andrews* 1651, *Myers* 11370 and *Schweinfurth* 3432) have been identified with the present species and help to bridge one of the apparent gaps in distribution. Doubtless other gaps in the wide arc of distribution from Portuguese East Africa to Senegal will be filled as time progresses.

Malacantha alnifolia (*Bak.*) *Pierre*, Not. Bot. Sapot.: 61 (1891); Engl., Monogr. Afr. Pfl. 8: 49 (1904); Hutch. & Dalz., Fl. W. Trop. Afr. 2: 12 (1931). Type: Nigeria, Onitsha, *Barter* 1788 (K, holotype!).

Chrysophyllum alnifolium Bak. in Oliv., Fl. Trop. Afr. 3: 499 (1877) (genus queried by original author).

Malacantha heudelotiana Pierre, Not. Bot. Sapot.: 61 (1891); Aubrév., For. Fl. C. Ivoire 3: 110 (1936), *non* sensu Hutch. & Dalz., Fl. W. Trop. Afr. 2: 12 (1931). Type: Gambia, Kombo, *Heudelot* 52, (P, holotype!).

Chrysophyllum ferrugineo-tomentosum Engl. in Engl., Bot. Jahrb. 28: 447 (1900). Types: Tanganyika, foot-hills of Uluguru Mts., *Stuhlmann* 8720 (B, syntype†) and between Mgeta and Mbakana, *Goetze* 338 (B, syntype†).

Malacantha ferrugineo-tomentosa (Engl.) Engl., Monogr. Afr. Pfl. 8: 48, t. 18A (1904); Check-list Trees & Shrubs Tanganyika Terr. 2: 563 (1949).

M. warneckeana Engl., Monogr. Afr. Pfl. 8: 48, t. 18B (1904). Type: Togo, Lome, *Warnecke* 413 (B, holotype†, EA, K, isotypes!).

M. obtusa C. H. Wright in Bull. Misc. Inf. Kew 1908: 58 (1908). Type: Lagos, *Foster* 37 (K, holotype!).

M. sp. Andrews, Fl. Pl. A.-E. Sudan 2: 374 (1952).

Pouteria alnifolia (Bak.) Roberty in Bull. I.F.A.N. 15: 1417 (1953) & Pet. Fl. Ouest-Afr.: 80 (1954).

Regarding the species *M. sacleuxii* Lecomte a duplicate of the type, *Sacleux* 1767, is available at Kew. Later gatherings from Zanzibar show the same characteristic development of a very dense indumentum of long deep rusty-brown hairs on the petioles and young stems. The hairs along the channelled midrib of the upper surface of the leaf are also very long and form an erect and projecting band for at least half of the length of the blade. The midrib and nerves of the lower surface are covered with a soft dense indumentum and indeed the whole leaf is very soft and woolly to the touch. This type of indumentum has not been encounted elsewhere and seems to be a variant peculiar to the Island of Zanzibar. It is proposed to reduce the species to varietal status, the name for the taxon becoming

Malacantha alnifolia (*Bak.*) *Pierre* var. **sacleuxii** (*Lecomte*) *J. H. Hemsl.*, stat. nov.

M. sacleuxii Lecomte in Not. Syst. 4: 62 (1923).

Young shoots and petioles with a ferrugineous pubescence of very densely arranged long ± erect hairs, giving a soft furry appearance to these parts. Older leaves with soft woolly indumentum on midrib and lateral nerves of leaf-undersurface.

The flowers of the type-specimen, *Sacleux* 1767, have previously been suggested as a possible reduced and female state with stamens missing.

Butyrospermum niloticum Kotschy

The species was described by Kotschy in Sitz. Kais. Akad. Wiss. Wien 50, Abth. 1: 358 (1865) together with an excellent plate of the plant. The holotype specimen, *Knoblecher* 61, which is now in the herbarium of the Vienna Natural History Museum, was collected from the banks of the White Nile in the vicinity of Gondokoro. Later collections have shown the tree to be frequent in this part of the Sudan and to extend southwards into Uganda. The author at the same time transferred *Bassia parkii* G. Don to his newly created genus *Butyrospermum* and provides an equally good description and plate of the species. He does not, however, discuss the differences thought to be significant but perusal of the descriptions and plates leads one to conclude

†Specimen now destroyed.

that the relative lengths of calyx and corolla and the shape of the staminodes were important diagnostic characters. *B. niloticum* is said to have the corolla scarcely exceeding the length of calyx whilst in *B. parkii* it exceeds this length; the staminodes of *B. niloticum* are said to be lanceolate with a recurved subulate tip and ciliolate margin and compare with an ovate-rotundate shape of *B. parkii* in which the margin is deeply trifid, ciliate and apex elongated and subulate. Examination of the plates suggests that the author misuses the terms ciliate and ciliolate and really intends serrate and serrulate, there being no indication of any hair fringe. The plate of *B. niloticum* depicts the staminodes in two ways. In fig. g, the interior of the corolla is opened out to show stamens and staminodes, the latter are represented as having clean entire margins and taper gradually to a subulate apex whilst in fig. i, a small section of the corolla shows one staminode and one stamen with subtending corolla-lobe. Here the staminode is clearly figured with an irregularly serrated margin and ending in a short abrupt acumen. This inconsistency seriously undermines a character-difference which from the text would have appeared important. Subsequent examination of herbarium material has shown the staminodes of specimens from Uganda, e.g. *Snowden* 270 or *Brasnett* 334, to be very similar indeed to those of West African flowers. They are slightly larger but conform closely in general shape, irregularly serrate margins and the terminal acumen. Under the circumstances it is not possible to maintain the shape of staminode as a character discontinuity. On the point of relative lengths of calyx and corolla, one can only state that this is not borne out by examination of the specimens now available. There seems to be no significant difference in the relative lengths of projection of corolla in the specimens examined by the present author.

B. niloticum has been reduced to varietal status under *B. parkii* by Engler, Monogr. Afr. Pfl. 8: 23 (1904) and is followed by A. Chevalier, Veg. Ut. Afr. Trop. 2: 32 (1907), and by Dale in Eggeling, Indig. Trees Uganda, ed. 2: 388 (1952). Andrews, Fl. Pl. A.-E. Sudan 2: 373 (1952) has however treated the taxon at specific level. These differences of opinion seem to arise from the fact that comparison of material of *B. niloticum* and *B. parkii* whilst suggesting tentative minor distinction at the same time shows the two taxa to be very close in general facies. Inspection of specimens from West Africa determined as *B. parkii* and comparison with material from the Sudan Republic and Uganda, gives an impression of *B. niloticum* as the ferrugineously hairy version of *B. parkii*. The flowers of *B. niloticum* would appear to be larger and a series of measurements have been made to investigate this point. Table 2 sets out the figures obtained and shows that, at least in some of the dimensions of the flowers, *B. niloticum* occupies the higher end of the size-range. This is most pronounced in the size of sepals and in length of filaments and styles. The prominence of the latter is a feature of *B. niloticum*, the length of exsertion equalling or exceeding the length of calyx or corolla-lobes. These measurements would seem to indicate that the flowers of *B. niloticum* are on the whole larger than those of *B. parkii* but the segregation is not so clearly defined as might be expected from a cursory inspection of the specimens.

Considering the characters of the indumentum, a range in density and size of hairs is found among the West African specimens of *B. parkii*. Taking *Carroll* 3, an example from Ghana with small flowers on long slender pedicels,

the indumentum is relatively sparse with the hairs a greyish-brown colour. This may be contrasted with a *Rowland* specimen from W. Lagos in which the flowers are borne on short stout pedicels and the hairs are ferrugineous and more densely arranged. Two varieties have been created under the species *B. parkii* by Chevalier, Veg. Ut. Afr. Trop. 2: 32 (1907). *B. parkii* (G. Don) Kotschy var. *mangifolium* A. Chev. which probably corresponds with the typical facies of the species and var. *poissoni* A. Chev. having young leaves with a short reddish pubescence and the fruits rounded as opposed to ovoid in the former variety. The var. *poissoni* was based on a specimen (*Poisson* 90) collected in Dahomey in 1903. Chevalier regards *B. niloticum* as a variety

TABLE 2. Measurements (in mm.) of parts of flowers of *Butyrospermum parkii* from specimens from West Africa and of *B. niloticum* from Uganda and the Sudan Republic.

B. parkii specimens from West Africa	Sepals length × width Outer	Sepals length × width Inner	Corolla-lobes l. × w.	Corolla-tube length	Filament length	Anther length	Style length
Ross 73	9·0 × 4·0	9·0 × 3·5	9·0 × 6·0	3·5	9·0	3·2	10·5
Carroll 1	9·5 × 3·5	9·0 × 3·0	7·0 × 4·5	2·5	7·0	4·0	12·0
Kitson 899	10·0 × 5·0	10·0 × 3·5	11·0 × 6·0	3·0	7·5	5·0	8·0
Elliott 23	10·0 × 4·5	9·5 × 4·0	9·0 × 6·0	3·0	7·0	4·0	9·5
Barter 1178	9·0 × 4·3	9·0 × 4·0	9·0 × 6·0	3·0	8·0	3·5	11·0
B. niloticum specimens from Sudan Republic and Uganda							
Brasnett 334	10·5 × 5·5	10·0 × 5·0	11·0 × 7·0	4·0	10·0	3·5	13·5
Schweinfurth 2785	8·5 × 5·0	9·5 × 5·0	7·5 × 7·0	4·0	12·0	3·5	13·0
Snowden 270	14·0 × 6·0	14·0 × 4·5	11·0 × 6·5	4·0	11·5	4·5	15·0
Speke & Grant 650	11·0 × 5·0	11·0 × 3·5	9·5 × 7·0	2·5	10·0	3·5	12·0

along with the two above mentioned and includes it under the same reference. In addition to an isotype specimen, two other specimens of Poisson, without numbers, are available in the Kew Herbarium and are from Dahomey, collected in 1901. They agree well with the authentic sheet and with a plate given by Chevalier, which is a reproduction of an earlier plate prepared in the Paris Herbarium under the direction of Pierre. The Kew specimens, both of which would appear to be part of the same gathering, are almost certainly to be assigned to Chevalier's variety *poissoni* and indeed bear this determination. They are in close agreement with the Rowland specimen mentioned previously from W. Lagos, the latter being the holotype of Baker's *Mimusops capitata* Bak. (in Bull. Misc. Inf. Kew 1895: 149 (1895)), the name being subsequently reduced under *B. parkii* by Engler (Monogr. Afr. Pfl. 8: 23 (1904)). In the absence of several representative

gatherings it is difficult to assess the status of var. *poissoni*. Material examined has suggested that should the taxon prove worthy of retention, it would be better to use the characters of short stout pedicel and dense rufous indumentum on pedicels and calyx, rather than those of indumentum on the young leaves and the fruit-shape, the latter in particular varying with the number of seeds maturing within.

Bearing in mind the important economic uses of the seeds, it is interesting to ascertain whether any differences exist in seed contents between samples from the two areas under consideration. I am indebted to Miss B. Youngman who has kindly provided the following note on this matter: 'There is no definite information available as to whether any differences exist in the yield of seed, although some observers (cf. Southcombe in Journ. Soc. Chem. Ind. 28: 499 (1909)) profess that differences exist in the amount and character of fat yielded by Shea nuts from Nigeria and by Karité nuts from the Sudan [Republic]. Samples from each of a number of provinces in Nigeria show considerable variation among themselves with regard to percentage kernel and shell, percentage oil in kernels and percentage unsaponifiable matter in oil. In a sample from the Sudan [Republic], the butter had similar properties to that usually received from West Africa but the Sudan sample had a somewhat low melting point and the percentages of unsaponifiable matter were lower than those usually present in West African samples. The oil content of the nuts from a particular tree is liable to vary from year to year as is also the amount of unsaponifiable matter in the oil. Properties also vary according to the state of the ripeness of the nuts.' This information is not inconsistent with the taxonomic treatment of the two taxa and would appear to indicate a close relationship between them.

Having already established a range in variability in the West African material, the status of *B. niloticum* will now be examined. As mentioned previously there are many points of similarity between the two taxa, especially in the form and appearance of the tree and in the habitat requirements. Geographically, the two species occur at the ends of a belt of woodland and savannah country, in a broad arc from the Guinea Republic to NW. Uganda. A close parallel may be drawn between this pattern and that of the *Manilkara multinervis–schweinfurthii* complex or between the character distribution of *Mimusops kummel* and *M. fragrans*. In each case we have to consider an extended distribution within the savannah belt, and characters involving dense versus sparse indumentia, or a question of larger and smaller flowers. The present author believes that these differences can best be expressed in the present case by the adoption of sub-specific rank for the taxa concerned. In such an arrangement the basic and fundamental unity of the taxon, in its broader sense, receives recognition, but at the same time a name is provided for the segregates which are, for a greater part of their range, both geographically and morphologically distinct.

It is therefore proposed to regard *B. niloticum* as the eastern representative of *B. parkii* and to be subspecifically distinct. This concept requires the following combination to be made.

Butyrospermum parkii (*G. Don*) *Kotschy* subsp. **niloticum** (*Kotschy*) *J. H. Hemsl.*, comb. et subsp. nov.

The taxon is distinguished from subsp. **parkii** by the dense ferrugineous indumentum on pedicels and outer sepals, the constituent hairs being long

and spreading and imparting a woolly appearance to these parts, especially in the bud stages. In addition the flowers tend to be larger, with style-lengths from 12·0–15·0 mm. (cf. 8·0–12 mm. in subsp. *parkii*). The indumentum is a conspicuous feature of the younger leaves and persists for a considerable time on the midrib and nerves of the lower surfaces of older leaves which contrasts with the glabrous state found in older leaves of the West African material.

Dematiaceous Hyphomycetes*.—This paper describes and figures 2 species of *Acarocybe*, 9 of *Pithomyces*, 10 of *Corynespora* and a new monotypic genus *Acarocybella*, based on *Cercospora jasminicola* Hansford. Of the new species 3 are British and the remaining 6 from tropical Africa.

R. W. G. Dennis

Mexican Orchids.†—The present reviewer is in complete agreement with Mr. Pelham Wright's suggestion that colour portraits of every interesting orchid in the world should be available; in fact he would probably take a broader view than would Mr. Wright of what is meant by the word interesting. It is true that many attractive Mexican orchids have yet to be figured adequately in colour. Unfortunately it cannot be said that the 40 illustrations in this book do much to remedy the deficiency. In view of the great strides which have been made in colour photography these pictures are disappointing in the extreme. The colours are frequently not true, the registration in the printing is rarely exact, the backgrounds are often excruciating, while pictorially the illustrations leave much to be desired as regards composition. Nor are they of much use botanically since very rarely can any details of the flowers be seen, while in some instances a part of the plant, which is stated in the text to be specially characteristic, is either omitted from, or only vaguely visible in the picture. Altogether this collection of illustrations can scarcely be recommended as giving any real idea of the beauty of Mexican orchids.

Mr. Wright provides a short introduction, while the text accompanying each plate contains notes on geographical distribution, popular names, etc., of the species figured. The nomenclature on the whole follows that adopted by Dr. L. O. Williams in his account of the orchids of Mexico. The text is in English and Spanish.

V. S. Summerhayes

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* *Dematiaceous Hyphomycetes: I.* Mycological Papers No. 76. By M. B. Ellis. Pp. 36. Kew: Commonwealth Mycological Institute, 1960. Price 10s.

† *Orquideas de Mexico.* By N. Pelham Wright. Pp. 23, 40 colour plates. Mexico City: Editorial Fournier, S.A., 1958. Price $10.

The Umbelliferae Illustrated.* – To illustrate the seventy or so Umbellifers represented in the British flora is something of an endurance test, and yet in no group of plants are drawings and dissections more useful, for the characters which distinguish genera and species are not easy to convey in words. Miss Ross-Craig has, on the whole, succeeded admirably in depicting the essential features of these (let us admit) rather tedious plants, and one hopes, as a result of her application, others will be encouraged to spend a little more time on the *Umbelliferae*, for they have hitherto ranked high in order of unpopularity. It is just a pity that those obscure principles which guide artists and authors in the selection of material should have been applied to exclude such well-known aliens as *Bupleurum lancifolium* (though several rarer congeners are shown), *Coriandrum sativum* and *Ammi majus* while admitting *Chaerophyllum aureum* and *Falcaria vulgaris*. But what selection ever satisfied everyone?

R. D. Meikle

Caroli Linnaei Genera Plantarum, ed. 5. 1754.† –The nomenclatural importance of the fifth edition of Linnaeus' 'Genera Plantarum' cannot be over estimated and the publishers of this new facsimile are to be congratulated on a fine piece of work, marred only by its excessive price and a somewhat weak binding.

The introduction by Dr. W. T. Stearn provides, in only twenty pages, a mass of information concerning the use of the book and its significance, together with a valuable guide to the often cryptic bibliographic references used by Linnaeus. It at once recalls the same author's much more exhaustive introduction to the Ray Society's recent facsimile of the 'Species Plantarum' and one feels that Dr. Stearn would have been very happy to have expanded his remarks to twice or three times the meagre space allowed him by the publishers.

The 'errata' noted on p. 500—'*Aesculus*' for '*Esculus*' (p. 161) and '*Prunella*' for '*Brunella*' (p. 261), were inserted by hand in the copy used for reproduction, and they appear corrected in the text. The rather uneven print of the original has been very well reproduced and is more legible in the facsimile, partly because of the good quality of the unglazed paper, but chiefly on account of first-class printing.

Most botanical libraries will wish to have this facsimile; for many of them it will satisfy a very old *desideratum*, but it is to be regretted that the publishers have priced it too high for many private individuals who were pleased to pay £5 10s. 0d. for the much bigger (but equally well produced) facsimile of the 'Species Plantarum' to which it is an indispensable complement. The text of the latter consists of 1200 pages, as well as introductory matter and indexes, against 500 pages in the present book.

A. A. Bullock

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* *Drawings of British Plants*, Part XII, Umbelliferae (1). By Stella Ross-Craig. 37 black & white plates. London: G. Bell & Sons Ltd., 1958. Price 9s. 6d.

† *Historiae Naturalis Classica*, ed. J. Cramer et H. K. Swann, tomus III: Caroli Linnaei Genera Plantarum editio quinta 1754. Facsimile, with an introduction [pp. i–xxiv] by W. T. Stearn. Weinheim: H. R. Engelmann (J. Cramer) and Codicote: Wheldon & Wesley Ltd., 1960. Price £7 5s. 0d.

Some inoperculate *Discomycetes* from New Zealand

R. W. G. Dennis

The majority of the fungi discussed below were forwarded to Kew for determination from the Herbarium of the Plant Diseases Division, Auckland, New Zealand. In attempting to name them it was necessary to re-examine the type-collections of a number of species described from New Zealand by Berkeley, Cooke and Phillips in the last century and preserved in the Herbarium of the Royal Botanic Gardens, Kew. The opportunity has therefore been taken to include modern descriptions of these old species and to figure those of which adequate illustrations are not already available to students.

GEOGLOSSACEAE

Trichoglossum hirsutum (*Pers.*) *Boud.* forma **leotioïdes** (*Cooke*) *Dennis*, comb. nov.

Geoglossum hirsutum Pers. var. *leotioïdes* Cooke in Grevillea 8: 61 (1879).
G. hirsutum Pers. forma *leotioïdes* (Cooke) Massee in Ann. Bot. 11: 244 (1897).

On the ground, Winton, *Berggren* 213 (type).

Massee gave a full description of this capitate form in the publication cited. The New Zealand material of *T. hirsutum* cited by Berkeley in 'Flora Novae-Zelandiae' is not at Kew.

Geoglossum glutinosum *Pers. ex Fr.*, Syst. mycol. 1: 489 (1821).

On the ground, Waitaki, *Berggren* 6, listed by Cooke, *op. cit.*, as *G. glabrum* var. *minor*, *nomen nudum*.

The material is scanty but appears to me to be a state of *G. glutinosum* in which the ascospores are more uniformly 7-septate than usual. Mains (in Mycologia 46: 591 (1954)) has described such ascomata with uniformly 7-septate ascospores from the United States of America.

DERMATEACEAE

Mollisia coprosmae *Dennis*, sp. nov.

Apothecia sparsa, superficialia, sessilia, e subsphaeroideo concava, demum planiuscula, latit. 1 mm., nigra, disco ochraceo pallido, margine elevato; cellulae excipuli globosae, atrae, 8–15μ diam.; asci clavati, octospori, 95 × 11μ, apice jodo vix tincti; ascosporae subdistichae, fusoideo-oblongatae, rectae vel leviter curvulae, hyalinae, 14–18 × 4–6μ; paraphyses filiformes, simplices, crassit. 1·5–2μ. Fig. 1, p. 294.

Supra cortices ramulorum *Coprosmae foetidissimae* (*Rubiaceae*), Harihari, Westland, 8.11.1954, *J. M. Dingley* 19049 (typus).

Cashiella montiicola (*Berk.*) *Dennis*, comb. nov.

Peziza montiaecola Berk. apud Hook., Fl. Nov.-Zel. 2: 201 (1855).
Mollisia montiaecola (Berk.) Sacc., Syll. Fung. 8: 325 (1889).

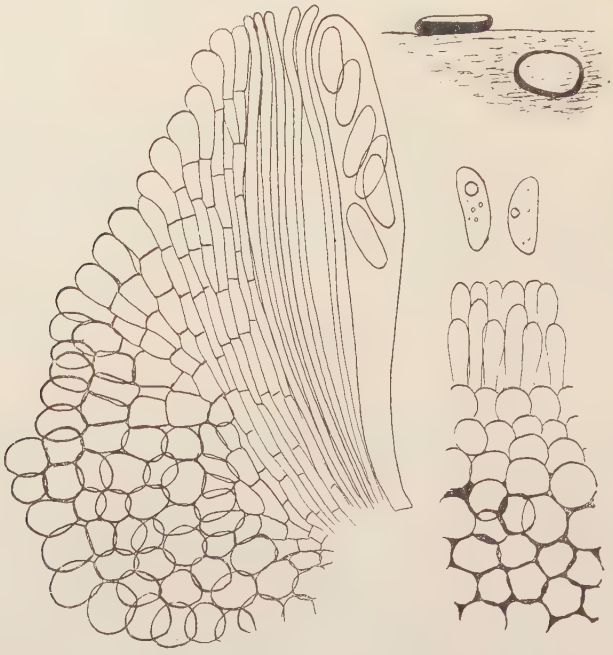


Fig. 1. *Mollisia coprosmae*. Habit sketch × 10, details × 660.

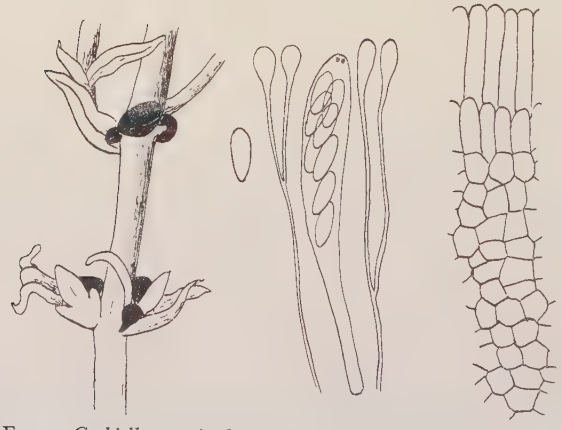


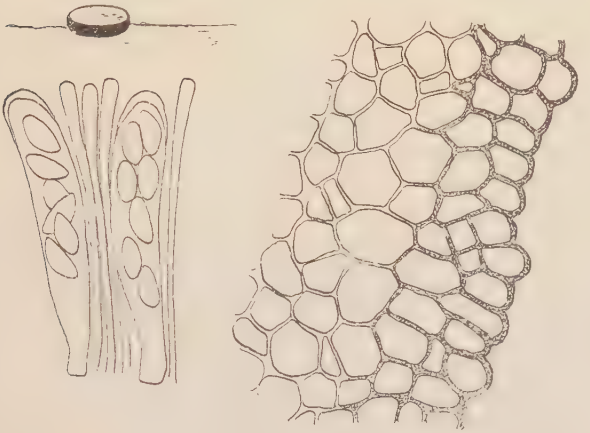
Fig. 2. *Cashiella montiicola*. Habit sketch × 10, details × 660.

Apothecia sessile, cupshaped, 0·5 mm. diam., black throughout, receptacle smooth, excipulum composed of isodiametric, rounded to angular, thin-walled, dark brown cells, up to 9 × 6μ, passing into parallel hyphae at the extreme margin only. Asci clavate, 8-spored, 65–70 × 9–10μ, the small pore blued by Melzer's reagent; ascospores biseriate above, uniseriate below,

ellipsoidal, hyaline, nonseptate. 9 11 × 3–4μ; paraphyses very slender, often forked, tips suddenly enlarged, pyriform, 3–5μ wide, forming an epithecium. Fig. 2.

On decaying *Montia fontana* (*Portulacaceae*), at the nodes, Ahuriri, Hawkes Bay.

I feel this species cannot be left in *Mollisia* because of its forked paraphyses with greatly enlarged brown tips cohering to form an epithecium. I have not seen the type species of *Cashiella*, *C. atra* Petrak, and refer the fungus here from his description only, though this does not indicate the iodine reaction of the asci or even, clearly, that they are inoperculate.



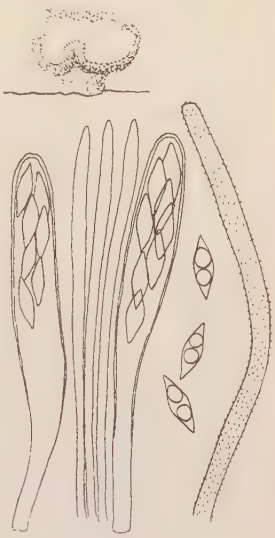


FIG. 3 (above). *Pseudopeziza colensoi*. Habit sketch × 10, details × 660.

FIG. 4 (on right). *Dasyscyphus apiculatus*. Habit sketch × 15, details × 660.

Pseudopeziza colensoi (*Berk.*) *Massee* in Journ. Linn. Soc., Bot. 31: 468 (1896).

Cenangium colensoi Berk. apud Hook., Fl. Nov.-Zel. 2: 201 (1855).

Apothecia gregarious, erumpent, orbicular, disc flat, pallid, about 1 mm. across, receptacle smooth, sooty brown. Flesh soft, white, composed of isodiametric cells about 10μ diameter; excipulum formed of 2–3 layers of similar cells with dark brown walls; asci cylindric-clavate, 8-spored, 60–70 × 8–10μ, apex somewhat thickened and pore not blued by Melzer's reagent; ascospores uniseriate to irregularly biseriate, elliptical or inequilateral, 9–12·5 × 3·5–5μ, hyaline, nonseptate; paraphyses cylindrical, slightly enlarged to 3μ at the obtuse apex. Fig. 3.

On dead leaves, 'apparently of *Phormium*', *Colenso* (type).

HYALOSCYPHACEAE

Dasyscyphus apiculatus *Dennis*, sp. nov.

Apothecia gregaria, erumpentia, stipitata; disco flavo, 1 mm. lato, excipulo alba, pilis erectis, obtusis, paullulum septatis, scabriusculis,

hyalinis, 75–80 × 3·5–5μ obtecto; asci clavati, octospori, 75–80 × 9–10μ, apice rotundati, jodo non tincti; ascosporae distichae, fusoideae, utrinque acutatae, biguttulatae, hyalinae, 11–14 × 3–4μ; paraphyses cylindraceae, apice acutatae, 2–2·5μ cr. Fig. 4, p. 295.

In cortice *Nothofagi fuscae*, 600 m., Lake Waikeremoana, Auckland district, 29.12.1955, *Dingley* 18987 (typus).

The rather round-topped asci lacking a pore-plug stained blue by iodine suggest a *Perrotia* but the paraphyses, though slender, seem to be pointed at the tip and the spores are not like those of other *Perrotias*. The material is unfortunately scanty and in poor condition and the generic position may be reconsidered when better collections are available. Spores of a rather similar trapezoidal shape, 8–12μ long, were described for *Lachnum trapeziforme* Vel., on *Carpinus* leaves in Czechoslovakia.

Dasyscyphus cassandrae (*Tranzschel*) *Dennis*, comb. nov.

Dasyscyphella cassandrae Tranzschel in Hedwigia 38, Beibl.: 11 (1899).
Erinella cassandrae (Tranzschel) Sacc. & Syd., Syll. Fung. 16: 757 (1902).

Apothecia in small clusters, short-stalked, disc about 1 mm. diameter, slightly concave, deep yellow with a low, white, downy margin; receptacle cupshaped, white or with the short stalk slightly brownish, clothed with dense white hairs. Hairs undulating, cylindrical or irregular in diameter, obtuse, thin-walled, finely granulate, multiseptate, up to 110 × 2–4μ; asci cylindric-clavate, apex conical with a small pore blued by Melzer's reagent, 110–120 × 9–10μ; ascospores fasciculate, undulating, cylindrical, up to 60 × 1·5–2μ; paraphyses cylindrical, up to 2μ wide, scarcely longer than the asci. Fig. 5.

On decorticated wood of cultivated *Rhododendron* sp., Mt. Eden, Auckland, March 1950, *G. H. Cunningham* 18978.

The material is rather poorly preserved with the hymenia largely destroyed by insects and ascospores have not been seen free from the asci so it is not certain if they ultimately become septate. The identification is based on Tranzschel's diagnosis only as no authentic material of *D. cassandrae* has been seen. The type was on dead twigs of *Cassandra calycantha* Don (*Ericaceae*) from european Russia. A collection (*G. H. Cunningham* 18979) on *Rhopalostylis sapida* (*Palmae*) from Whangarei, Parahaki reserve, seems scarcely distinct in spite of the very different substrate.

Dasyscyphus cerinus (*Pers. ex Fr.*) *Fuck.* in Jahrb. Nass. Vereins f. Naturkunde 23/24: 305 (1870).

On decorticated wood of *Nothopanax sinclairii*, 900 m., Mt. Egmont, Taranaki district, 23.3.1951, *Dingley* 18984.

Dasyscyphus clandestinus (*Bull. ex Saint Amans*) *Fuck.*, *l.c.* 305 (1870).

On dead canes of *Rubus idaeus*, Tapawera, Nelson district, 13.1.1948, *P.D.D. No.* 18983.

This is the characteristic substrate of this common European species, perhaps introduced with its host though there is no reason to suppose it parasitic.

Dasyscyphus corticola (*Massee*) *Dennis*, comb. nov.

Erinella corticola Massee in Bull. Misc. Inf. Kew 1898: 115 (1898).

Apothecia scattered, superficial, with short stout stalks; disc up to 2 mm. diameter, almost flat when fresh, with a low rim, deep yellow; receptacle pallid, clothed with fine light brown hairs, flesh compact, white. Hairs cylindrical, undulating, obtuse, up to 160 × 3·5 4μ, with thin, brown, finely granulate walls and numerous septa. Asci cylindric-clavate, 100–115 × 8–9μ, 8-spored, apex conical, with a minute pore blued by Melzer's reagent; ascospores fasciculate, cylindrical, 7-septate, 54–62 × 1·5–2μ; paraphyses slightly enlarged upwards to 3μ, scarcely longer than the asci and not acutely pointed. Fig. 6.

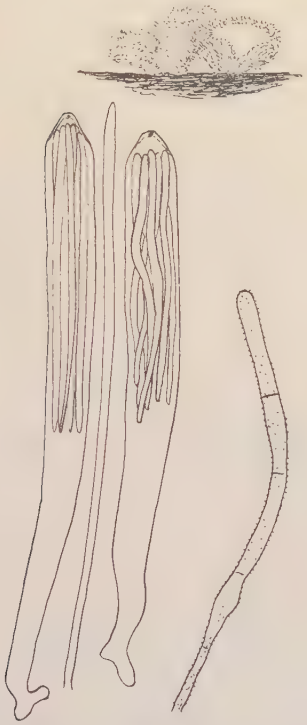


Fig. 5. *Dasyscyphus cassandrae*. Habit sketch × 10, details × 660.

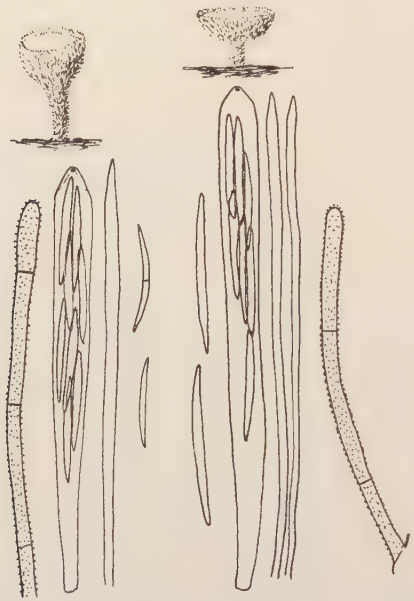
Fig. 6. *Dasyscyphus corticola*. Habit sketch × 10, details × 660.

On bark, Dehra Dun, India, *Gamble* 25545 (type); on decorticated wood of *Ulex europaeus*, Pukematakeo, Waitakere ranges, Auckland district, 21.10.1956, *S. D. Brook* 19033; on bark of *Melicope ternata* (*Rutaceae*), Huia, Auckland, 29.11.1952, *Dingley* 18977.

Dasyscyphella schroeteriana Rehm (1900) from Brasil, seems doubtfully distinct. *Peziza leucophaea* Berk. & Curt. (1860), on sticks in Japan, is similar but paler and with slightly longer ascospores, 60–70 × 1·5μ. *D. corticola* must not be confused with the common European *D. corticalis* (Pers. ex Fr.) Massee, which has 1-septate ascospores 10–20 × 2–3·5μ.

Dasyscyphus emerici (*Berk. & Phil.*) *Sacc.* var. **nothofagi** *Dennis*, var. nov. a typo ascosporis 22–32 × 2–2·5μ, ascis longioribus differt.

Apothecia scattered, superficial, on bark, disc concave, about 1 mm. diameter, brown; receptacle concolorous, with short cylindrical stalk, clothed with whitish downy hairs which are cylindrical, obtuse, sparingly septate, with thin, hyaline, finely granulate walls, about 70 × 3·3·5μ. Asci cylindric-clavate, 8-spored, 100–105 × 7–8μ, the minute pore blued by Melzer's reagent; ascospores 2–3-seriate, narrowly fusoid, 22–32 × 2–2·5μ; paraphyses cylindrical with pointed tips, 2–2·5μ wide, no longer than the asci. Fig. 7.



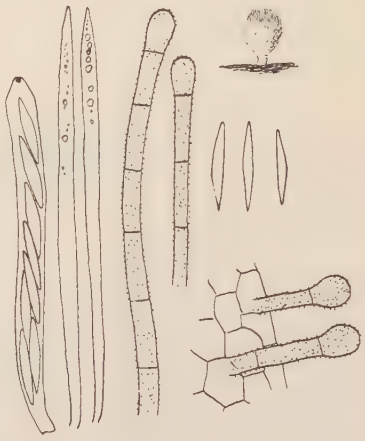


Fig. 7 (on left). Left: *Dasyscyphus emerici*, type collection. Right: *D. emerici* var. *nothofagi*. Habit sketch × 10, details × 660.

Fig. 8 (above). *Dasyscyphus filiceus*. Habit sketch × 12, details × 660.

On bark of *Nothofagus menziesii*, Milford, Otago, Feb. 1948, *Dingley* 18986 (type).

D. emerici was on herbaceous stems in the Nilgiri Hills, India. Externally it is indistinguishable from *Dingley* 18986 but yields ascospores 18–22 × 1·5μ in asci 85 × 8μ. The hairs of *D. emerici* vary between hyaline and light brown. Phillip's manuscript notes with the type specimen indicate that he found ascospores 25–30μ and the size given in the diagnosis was 18–25 × 2μ. The Indian and New Zealand fungi certainly seem closely allied but in view of the apparent difference in spore size and the widely different substrata I feel it unwise to regard them as identical. Their relationship to *D. javanicus* Penz. & Sacc., on ferns, with ascospores 16–22 × 2–2·5μ and *D. ochroleucus* Penz. & Sacc., on bark, with ascospores 27–28 × 3μ, needs further study.

Dasyscyphus filiceus (*Cooke & Phil.*) *Sacc.*, Syll. Fung. 8: 451 (1889). *Peziza filicea* Cooke & Phil. in Grevillea 8: 62 (1879).

Apothecia scattered, superficial, cupshaped with short cylindrical stalks, up to about ⅓ mm. diameter, white throughout, clothed with cylindrical,

obtuse, often slightly capitate, thin-walled, septate, hyaline, finely granulate hairs which are 25–35 × 3–3·5μ on the flanks but up to 75 × 5·5μ at the margin. Asci cylindric-clavate, pore blued by Melzer's reagent, 8-spored, 70 × 6μ; ascospores irregularly biseriate, fusoid, 14–18 × 2–2·5μ; paraphyses lanceolate, up to 3μ wide, with oily contents, protruding about 10μ beyond the asci. Fig. 8.

On rachis and pinnae of *Dicksonia squarrosa*, Dunedin, *Berggren* 400 (type).

Dasyscyphus glabrescens (*Cooke & Phill.*) *Sacc.*, Syll. Fung. 8: 451 (1889).

On petioles of *Cyathea dealbata*, Kauaeranga valley, Thames, Auckland district, *S. D. Baker* 18989.

The New Zealand material is in much better condition than the type but seems to represent the same species. Asci 80–93 × 8μ, ascospores elliptic-fusiform, 14–17 × 2·5 -3·5μ, paraphyses narrowly lanceolate, 2–3μ wide and up to 10μ longer than the asci, hairs about 70 × 3–4μ.

Dasyscyphus hyalopus (*Cooke & Massee*) *Dennis* in Kew Bull. 13: 327 (1958).

On dead *Phormium*, *T. Kirk* 340.

For description see Dennis, *l.c.* (1958).

Dasyscyphus inspersus (*Berk. & Curt.*) *Sacc.*, Syll. Fung. 8: 437 (1889).

On bark of *Nothofagus menziesii*, 600 m., Upper Homestead, Poronui, Hawkes Bay district, 2.6.1953, *Dingley* 18988.

Dasyscyphus melanophthalmus *Dennis*, sp. nov.

Apothecia subgregaria, superficialia, stipitata, patelliformiter explanata, disco atro, 1–1·5 mm. lato, excipulo brunneo, pilis rectis, cylindraceis, apice rotundatis, septatis, scabriusculis, hyalinis, 50–60 × 3–4μ hirsuto. Asci cylindracei, octospori, 120 × 8–9μ, apice jodo coerulescentes; ascosporae bacillares, rectae vel curvatae, hyalinae, 35–45 × 1·5μ; paraphyses cuspidatae, vix prominentes, media 3μ cr. Fig. 9, p. 300.

In ligno emortuo *Nothofagi*, Tararua ranges, Wellington, April 1950, *P.D.D. No.* 18981 (typus).

Durieu's figure of *Peziza phaeotricha* (in Expl. Sci. Algérie, Bot. tab. 28, fig. 5A) gives a good idea of the macroscopic appearance of *D. melanophthalmus* but Durieu's fungus was on leaves of *Quercus ilex*. The hairs of *Dingley* 18981 bear a reddish-brown gummy secretion at their tips and the colour of the receptacle varies from light brown to deep red-brown according to the quantity of this exudate. The excipulum is composed of thin-walled, hyaline, prismatic cells and the disc, black when dry, appears reddish-brown when soaked up. *D. javanicus* Penz. & Sacc. differs in its fusiform ascospores 16–22 × 2–2·5μ.

Dasyscyphus pteridicola *Dennis*, sp. nov.

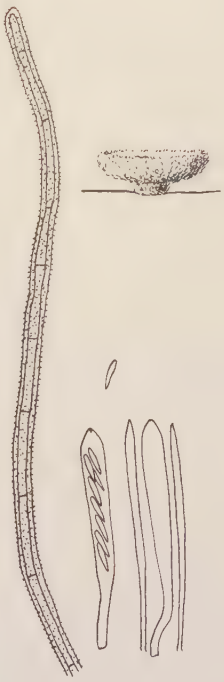
Apothecia sparsa, superficilia, subsessilia; disco rufo-brunneo, concavo, 1–2 mm. lato; receptacula atro-brunnea, extus pilis levibus fuscis, obtusis,

flexuosis, scabriusculis, septatis, 130 × 4μ obsita, pedicule sat breve. Asci clavati, octospori, 45 × 4μ, apice jodo coerulescentes; ascosporae distichae, fusoideae, continuae, 6–7 × 1μ; paraphyses lanciformes, 1·5–2μ cr. Fig. 10.

In petiolis emortuis *Cyatheae dealbatae*, Waiatarua, Waitakere ranges, Auckland, Nov. 1948, *Dingley* 18980 (typus).

Dasyscyphus pteridophyllus *Rodway* in Pap. & Proc. Roy. Soc. Tasmania 1920: 158 (1921).

On *Cyathea dealbata*, 15 m., Lake Papaetonga, Wellington, 31.8.1952, *G. H. Cunningham* 18976.



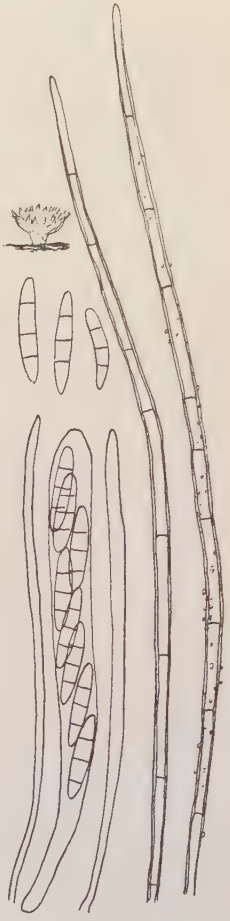


Fig. 9 (above left). *Dasyscyphus melanophthalmus*. Habit sketch × 10, details × 660.

Fig. 10 (above right). *Dasyscyphus pteridicola*. Habit sketch × 10. details × 660.

Fig. 11 (on right). *Dasyscyphus triseptatus*. Habit sketch × 8, details × 660.

Dasyscyphus triseptatus *Dennis*, sp. nov.

Apothecia sparsa, superficialia, subsessilia; disco pallido, concavo, 1 mm. lato; excipulo pilis rectis, acutatis, septatis, tenui tunicatis, 170–240 × 3–4μ obtecto; asci clavati, octospori apice jodo non tincti, 95 × 9μ; ascosporae rectae vel curvulae, ellipticae, triseptatae, 16–21 × 3–3·5μ; paraphyses lanciformes, 2–3μ cr. Fig. 11.

Ad corticem *Scheffierae digitatae* (*Araliaceae*), Waiko, Westland, 5.11.1954, *Dingley* 18985 (typus); in ramis emortuis, Carter's Bush, Carterton, Wellington, 25.11.1958, *Dingley* 18982.

Absence of a blue pore reaction with iodine may suggest a *Perrotia* but the paraphyses are distinctly lanceolate and the tapering smooth-walled hairs bearing scattered, loosely attached, rounded granules probably indicate rather a relationship with *D. corticalis*.

Dasyscyphus cf. **virgineus** *S. F. Gray*, Nat. Arrang. Brit. Plants 1: 671 (1821).

On rotting wood, Orakei, Purewa Bush, Auckland district, 26.8.1950, *D. W. McKenzie* 19051.

The apothecia are old and discoloured with rather short hairs but obviously belong to some member of the *D. virgineus* complex. Hairs obtuse, thin-walled, granulate, up to 50 × 3μ, asci 45–50 × 4μ, ascospores 6–8 × 1–1·75μ, paraphyses lanceolate, 3μ wide.

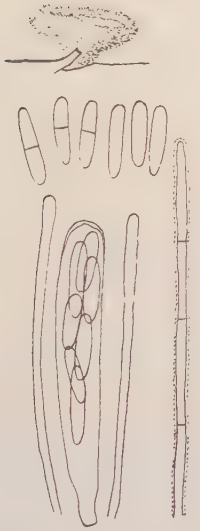


Fig. 12. *Perrotia alba*. Habit sketch × 15, details × 660.

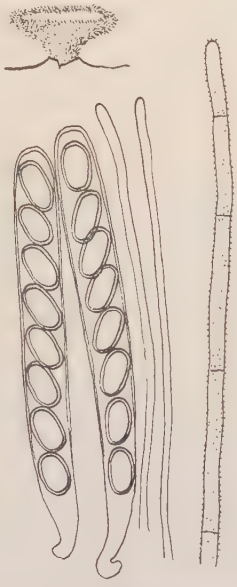


Fig. 13. *Trichoscyphella phyllocladi*. Habit sketch × 15, details × 660.

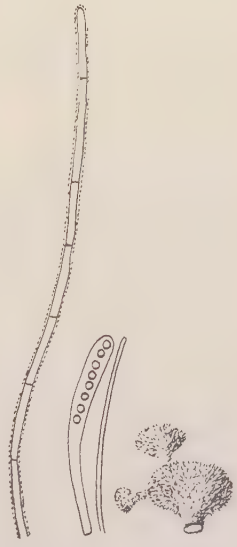


Fig. 14. *Lachnellula calycina*. Habit sketch × 10, details × 660.

Perrotia alba *Dennis*, sp. nov.

Apothecia sparsa, erumpentia, substipitata; disco flavido, concavo, 1 mm. lato; excipulo alba, pilis obtusis, hyalinis, crasse tunicatis, scabriusculis, septatis, 120 × 3μ obtecto; asci cylindracei, apice rotundati, octospori, 60–70 × 8·9μ, apice jodo non tincti; ascosporae distichae, rectae, ellipticae, hyalinae, 12–17 × 3–4, utrinque rotundatae, demum medio septatae, non constrictae; paraphyses filiformes, ad apicem 2μ crassae. Fig. 12.

In ramulis emortuis *Aristoteliae fruticosae*, 900 m., Mt. Egmont, Taranaki district, 23.3.1951, *Dingley* 18994 (typus).

Trichoscyphella phyllocladi *Dennis*, sp. nov.

Apothecia sparsa, erumpentia, subsessilia; disco ochraceo, 1 mm. lato; excipulo alba, pilis cylindraceis, scabriusculis, obtusis, septatis, 160 × 2·5–3μ obtecto; asci clavati, octospori, apice rotundati jodo non tincti, 80–90 × 9μ; ascosporae monostichae, ellipticae, hyalinae, continuae, 9–10·5 × 5–5·5μ; paraphyses filiformes, ad apicem 2μ crassae. Fig. 13, p. 301.

Ad corticem *Phyllocladi alpini*, 960 m., Arthur's Pass, Canterbury, 17.1.1956, *Dingley* 18990 (typus).

There seems to be little beyond the small size of the apothecia to differentiate this from *Trichopeziza gallica* (Karst. & Har.) Boud., described from an unnamed conifer in France. In view of the uncertainty regarding the substrate of the latter I have thought it advisable to provide a different specific epithet which will be clearly applicable to the New Zealand fungus, especially as the two fungi in question are literally poles asunder.

Lachnellula calycina *Sacc.*, Syll. Fung. 8: 391 (1889).

Lachnellula schumannii Rehm in Rabenhorst Kryp. Flora, Ed. 2, 1(3): 86 (1893).

Trichoscypha vuillemini Boud., Discom. d'Europe: 125 (1907).

Lachnellula rehmii Ferdinandsen & Jørgensen, Skovtraeernes Sygdomme: 182 (1938).

Apothecia gregarious, erumpent, sometimes proliferating from the margin, disc pale cream, up to 1 mm. across; receptacle white, short-stalked, hairs cylindrical or slightly tapered at the tip, rather thick-walled and stiff, hyaline, granulate, multiseptate, up to 110 × 2·5 -3μ; asci clavate, stipitate, apex rounded, not stained by Melzer's reagent, 40 × 4μ, 8-spored; ascospores uniseriate, globose, hyaline, 1·5–2μ; paraphyses cylindrical, 1μ thick. Fig. 14, p. 301.

On bark of conifers in association with resin-flows. On *Pinus radiata*, Wellington, May 1942, collector unknown, No. 18991; on *Cupressus lawsoniana*, Rimu Forestry Plantation, 11.11.1954, *Dingley* 18992.

I have retained the traditional division of hairy, corticolous, subsessile *Helotiales* with cylindrical obtuse paraphyses and asci with negative iodine reaction into *Lachnellula* Karst. (1885) with spherical ascospores, *Trichoscyphella* Nannf. (1932) with ascospores of any other shape on conifers and *Perrotia* Boud. (1901) on other woody plants, usually with cylindrical septate ascospores and coloured hairs. There seems little to justify this division at the generic level, however, especially in view of *Perrotia alba* described above, with hyaline hairs but not on a conifer. If they are reunited but still kept distinct from *Dasyscyphus* S. F. Gray (1821), *Trichopeziza* Fuckel (1870) and *Belonidium* Mont. & Dur. (1846) the oldest generic name will apparently be *Lachnellula*. In 1907 Boudier already united *Trichoscyphella* and *Lachnellula* but under his own invalid generic name *Trichoscypha* (1885), a later homonym of *Trichoscypha* Hook. f. (1862) in the *Anacardiaceae*.

Arachnopeziza rhopalostylidis *Dennis*, sp. nov.

Apothecia gregaria, sessilia, pallido-albida, siccitate pallido-lutea vel carnea, latit. 0·5–0·75 mm., margine tenuiter albo-villosulae fimbriato. Asci

oblongati, octospori, 115 × 10–11μ, apice ultimo obsolete jodo coerulescente; ascosporae conglobatae, bacillares, arcuatae, hyalinae, 75–80 × 2μ; paraphyses filiformes, crassit 2μ. Pili cupulae brevissimi, articulati, apice obtusi, tenue-tunicati, 25–45 × 3–4μ. Fig. 15.

In foliis *Rhopalostylidii sapidi* (*Palmae*), Henderson, Waitakere Ra., Auckland, 11.12.1955, *Dingley* 18975 (typus).

One may, perhaps, question the propriety of assigning to *Arachnopeziza* a fungus without a visible subiculum. The apothecia, however, are densely crowded over extensive, sharply defined, patches of the substrate, distinctly paler coloured than the remainder and must arise from a common mycelial

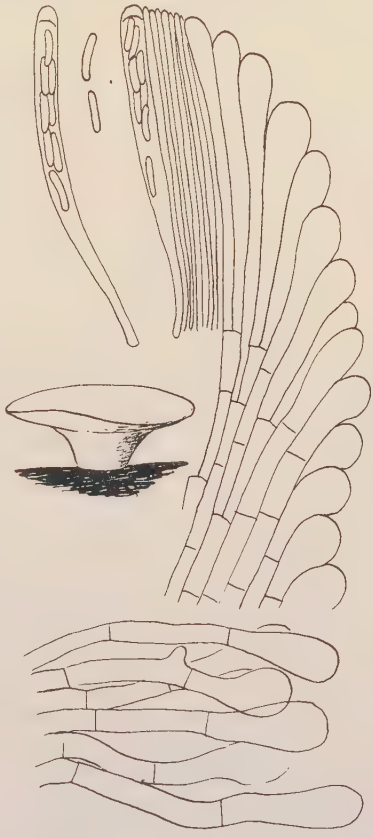


Fig. 15 (above). *Arachnopeziza rhopalostylidis*. Habit sketch × 10, details × 660.

Fig. 16 (on right). *Helotium allantosporum*. Habit sketch × 10, details × 660.

mat even if it does not form an evident subiculum. The fasciculate ascospores, slender thin-walled hairs and cylindrical obtuse paraphyses all agree with *Arachnopeziza*, though the spores do not appear to become septate in the asci. The alternative genus without a subiculum would seem to be *Lasiobelonium*, the type species of which, *Belonidium amoenum* Speg., is imperfectly known.

HELOTIACEAE

Helotium allantosporum *Dennis*, sp. nov.

Apothecia subsparsa, superficialia, brevissime stipitata, umbrina, leviter puberula, 2·5 mm. lata, margine integra. Asci cylindraceo-clavati, apice jodo

non tincti, octospori, 60–70 × 5μ; ascosporae oblongato-ellipsoideae vel allantoideae, distichae, continuae, 8–9 × 1·5μ; paraphyses filiformes, 1–1·5μ crassae, apicem versus haud incrassatae. Fig. 16, p. 303.

Ad cortices arborum frondosarum, Huia, Auckland, 4.5.1957, *J. D. Atkinson* 19034 (typus).

Flesh dark brown throughout, composed of loosely woven purplish-brown hyphae 3–4μ wide; excipulum composed of parallel, brown, thin-walled hyphae lying at a low angle to the surface, their tips running out into 1–2-celled cylindrical hairs, with the tip cell inflated to 8–10μ diameter. These hairs recall those of *Chlorosplenium versiforme* but the fungus completely lacks green or olive tints and can scarcely be referred to that genus.

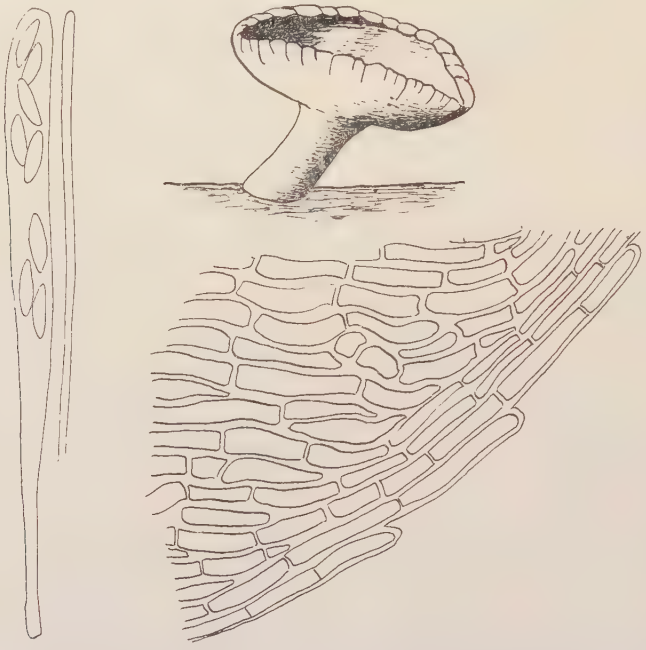


Fig. 17. *Helotium magellanicum*. Habit sketch × 10, details × 660.

Helotium elaeocarpi *Dennis*, sp. nov.

Apothecia sparsa, superficialia, sessilia, cupulata, ceraceo-lutea, disco 0·5 mm. lato. Asci 125 × 9–10μ, longe cylindrici, basi breviter attenuati, apice obtusi, octospori, apice jodo coerulescentes; ascosporae monostichae, late ellipticae, 13–15 × 6–7·5μ; paraphyses simplices, filiformes, apice subincrassatae, 2–4μ cr. Fig. 18.

In foliis *Elaeocarpi dentati*, Oratia, Waitakere Ra., Auckland, 7.7.1957, *Dingley* 19047 (typus).

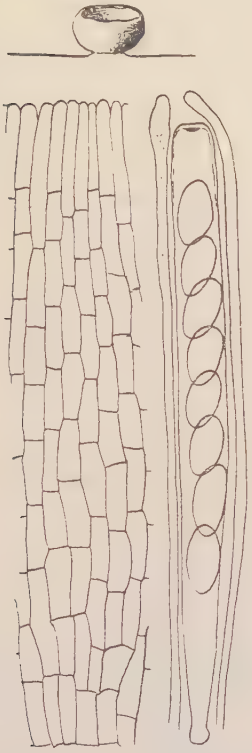
Helotium griseliniae *Dennis*, sp. nov.

Apothecia sparsa, erumpentia, stipitata, ceraceo-mollia, glabra, purpureo-brunnea; cupula patelliformis, margine integerrimo, disco planiusculo vel convexiusculo, latit. 3 mm.; stipes subaequalis, saepe curvatis, deorsum

incrassatulus. Asci cylindraceo-clavati, octospori, 110–125 × 10μ, apice jodo coerulescentes; ascosporae ellipsoideae, 12–14 × 4–5μ; paraphyses filiformes, crassit. circiter 2μ. Fig. 19.

In foliis dejectis *Griseliniae littoralis*, (*Cornaceae*), 900 m., Ruapehu, Auckland, 20.10.1949, *Dingley* 19046 (typus).

Excipulum composed of parallel, short-celled hyphae, 7–8μ wide, with thin, soft, red-brown walls, lying at a low angle to the surface.



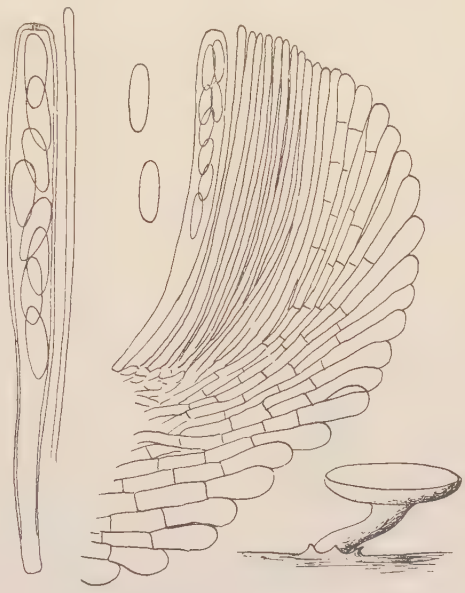


Fig. 18 (on left). *Helotium elaeocarpi.* Habit sketch × 10, details × 660.

Fig. 19 (above). *Helotium griseliniae.* Habit sketch × 7, details × 660.

Helotium leucopus *Mont.* apud Gay, Hist. de Chile, Bot. 7: 410 (1850). On dead leaf of *Knightia excelsa* (*Proteaceae*), 360 m., Lake Okaitana, Auckland, 20.6.1951, *Dingley* 19050.

The type-collection was on leaves of *Persea lingue* (*Lauraceae*), Valdivia, Chile. The species is very near *H. caudatum* (Karst.) Vel. (1934), recorded on dead leaves of a wide range of Dicotyledonous trees and shrubs in Europe and North America. In the Chilean and New Zealand collections, however, there are from 4 to 6 well-developed guttules in the spores, which measure 18–22 × 4–5·5μ, whereas European material has spores containing scattered granules as described by Karsten 'eguttulatae vel guttulis paucis praeditae'.

Helotium magellanicum *Dennis*, nom. nov.

Chlorosplenium fuegianum Speg. in Bol. Acad. Nac. Cienc. Cordoba 11: 1887, *non Helotium fuegianum* Speg., *l.c.*

Apothecia scattered, superficial, disc concave, 3 mm. diameter, drying Hay's Brown (Ridgway), receptacle cupshaped with a well-developed cylindrical stalk, pruinose with short, free, hyphal tips, vertically ribbed and furrowed towards the margin, Deep Olive Buff. Flesh homogeneous, composed of compact hyphae, 4–5μ wide, becoming parallel at a low angle to the surface in the outer layers. Asci clavate. long stalked, 115–120 × 10–12μ, 8-spored, pore not blued by Melzer's reagent; ascospores biseriate, fusoid, 10–12·5 × 3–3·5μ; paraphyses cylindrical, obtuse, 2μ wide. Fig. 17, p. 304. On rotten wood in forest, *Colenso B*396; under logs, *Colenso B*324.

For this determination I am indebted to Mrs. Gamundi de Amos, who has kindly sent me part of a collection from Nahuel Huapi National Park, which she has compared with the type in Spegazzini's herbarium at La Plata. Massee gave the New Zealand material the apparently unpublished name *Chlorosplenium flavovirens*. In spite of the presence of a greenish pigment the structure of the apothecium seems to me that of an *Helotium* rather than of a *Chlorosplenium*. There is already a *Helotium flavovirens* (Pers.) Fr.

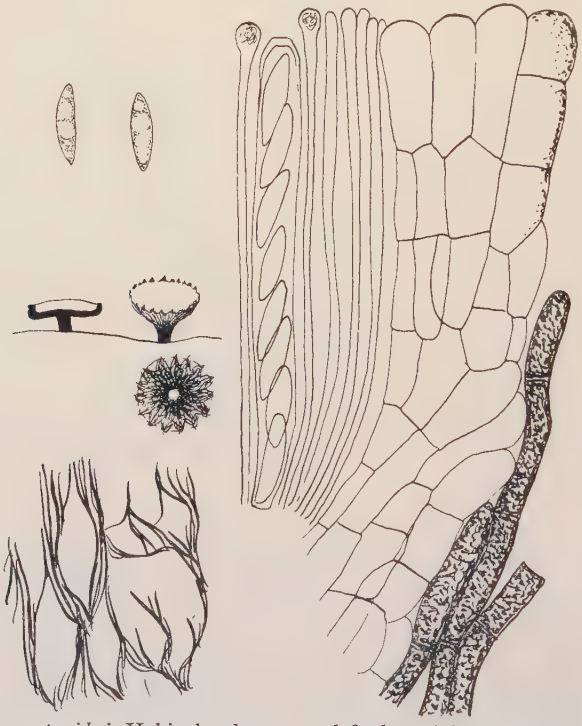


Fig. 20. *Helotium metrosideri*. Habit sketches × 10, left, dry; right, soaked up, details × 660, except for diagram of surface net which is c. × 100.

Helotium metrosideri *Dennis*, sp. nov.

Apothecia sparsa, superficialia, stipitata, disco plano, luteo, 1 mm. lato; cupula applanata, atra, longitudinaliter fibrillosa, margine dentibus coronata; stipes brevis, atris, in cupulam abiens. Asci cylindraceo-clavati, octospori, 90–95 × 8–9μ, apice jodo non tincti; ascosporae monostichae, fusoideo-ellipsoideae, 2–4-guttulatae, hyalinae, 14–17 × 4–5μ; paraphyses filiformes, apicem versus incrassatae. Fig. 20.

In foliis *Metrosideri* (*Myrtaceae*), Waiatarua, Waitakera Ra., Auckland, 29.5.1958, *Dingley* 19040 (typus).

H. metrosideri is structurally not unlike *H. scutula*, with flesh of loosely woven hyaline hyphae, 8–10μ wide, and excipulum of compact parallel hyphae of similar size, lying at a low angle to the surface, covered by a thin web of more slender hyphae pulled somewhat apart into a mesh-work as the apothecium expands on wetting. These surface hyphae, 4–6μ wide, are blackened by a granular deposit. There is in this a close resemblance to the structure of *H. spadiceo-atrum* (Mont.) Sacc., on *Gunnera scabra* in Juan Fernandez, but in the latter the ascospores are only 9–10 × 3μ and the surface hyphae have a reddish-brown granulation and yield a purple solution in KOH.

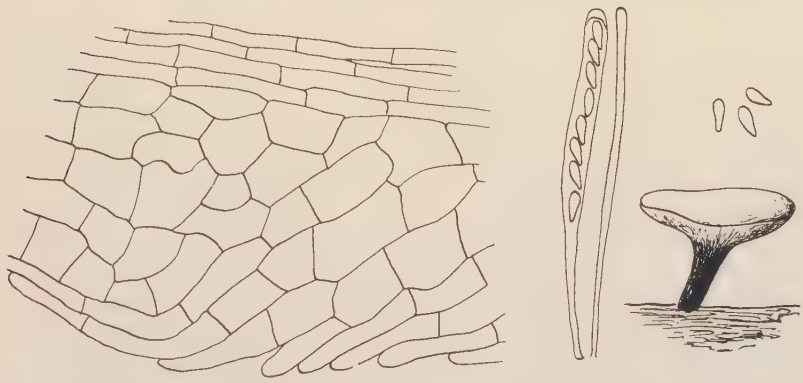


FIG. 21. *Helotium novae-zelandiae*. Habit sketch × 10, details × 660.

Helotium novae-zelandiae *Dennis*, sp. nov.

Apothecia sparsa, superficialia, stipitata, 2 mm. alta, disco plano aut parum convexo, luteo, 2 mm. lato, margine integro non prominulo, stipite fibrilloso et ad basim atro-brunneo. Asci cylindrico-clavati, octospori, 60–70 × 4·5–5·5μ, apice jodo non tincti; ascosporae clavatae, hyalinae, monostichae vel subdistichae, 6–7 × 2–2·5μ, paraphysibus simplicibus, ad apicem obtusis et paullulum incrassatis 2μ crassis. Fig. 21.

Ad ramum decorticatum, Black Gully, Tapanui, Otago, 19.4.1957, *S. D. & P. J. Brook* 19039 (typus).

This fungus bears considerable resemblance to *H. vernalis* Dennis but has smaller more clavate ascospores. The excipulum is formed of rows of large, short, thin-walled cells, up to 12μ wide, terminating in short adpressed fibrils. *Rutstroemia fusco-brunnea* (Pat. & Gaill.) Le Gal is similar in structure but has a very long slender stipe.

Helotium pezizoïdeum *Cooke & Phil.* in Grevillea 19: 72 (1891).

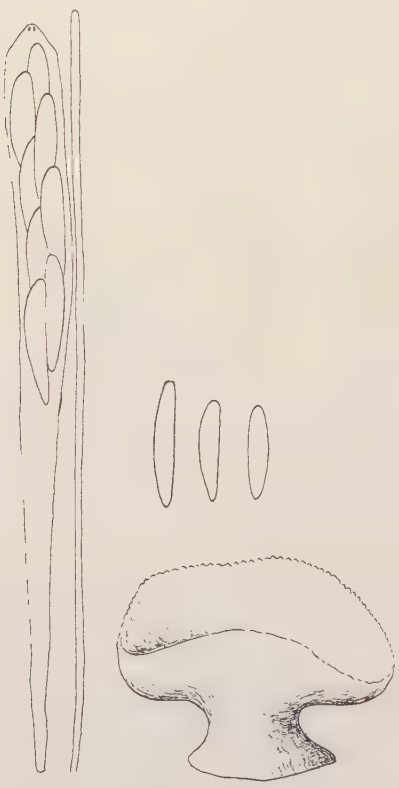
Waitaki, *Berggren* 281.

For description see Kew Bull. 13: 335 (1958).

Helotium phormium *Cooke* in Grevillea 8: 63 (1879).

Apothecia scattered, erumpent, disc flat, 0·5 mm. diameter, dark brown; receptacle cup-shaped, smooth, concolorous, soft-fleshed, on a usually paler cylindrical stalk. Excipulum composed of parallel hyphae, 3–5μ wide, thin-walled, lying at a low angle to the surface and with their tips protruding as short, downy, nonseptate, cylindrical hairs. Asci clavate, 130× 15–21μ, 8-spored, pore outlined blue in Melzer's reagent; ascospores biseriate, elliptic-cylindric with somewhat pointed ends, straight or slightly curved, nonseptate, 26–34 × 5–6μ; paraphyses cylindrical, obtuse, about 2–3μ thick at the apex. Fig. 22.

On *Phormium tenax*, Maungaroa, *Berggren* 388 (type).



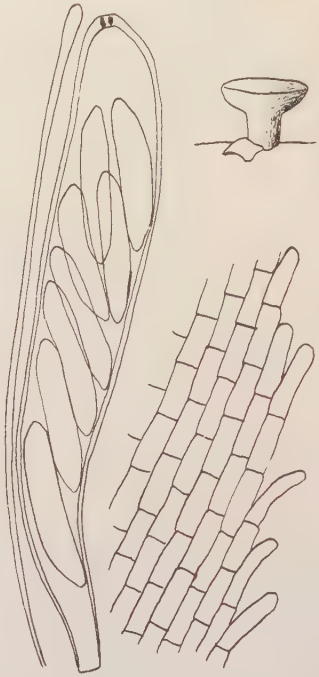


Fig. 22 (above). *Helotium phormium*. Habit sketch × 20, details × 660.

Fig. 23 (on left). *Helotium pseudociliatum*. Habit sketch × 12, details × 660.

Helotium pseudociliatum *Phil.* in Grevillea 15: 17 (1886).

Cyathicula pseudociliata (Phil.) Sacc., Syll. Fung. 8: 307 (1889).

Apothecia scattered, superficial, disc concave, flesh coloured, 3 mm. wide; receptacle soft, cupshaped, smooth, with a minutely crenate margin, seated on a short stout stalk. Excipulum composed of slender, parallel, compact hyphae, 2μ wide, with thin, hyaline, nongelatinised walls, lying at a low angle to the surface. Asci clavate, 145 × 11μ, 8-spored, pore outlined blue in Melzer's reagent; ascospores biseriate, narrowly elliptical to inequilateral, 18–25 × 4–5μ, nonseptate; paraphyses cylindrical, obtuse, 1·5μ thick. Fig. 23.

On rotten wood, *Colenso* B100; B380.

Colenso B380 is labelled 'Margin red and ciliate' but that of the dried material is now perfectly even.

Helotium quintiniae *Dennis*, sp. nov.

Apothecia gregaria, stipitata, cyathiformia, disco vix 1 mm. lato, castaneo, excipulo ex hyphis elongatis, parallelis, 5–6μ crassis contexto. Asci clavati, octospori, 55–60 × 4–5μ, apice subacutati, jodo coerulescentes; ascosporae monostichae vel subdistichae, hyalinae, continuae, ellipticae, 5 × 2μ; paraphyses filiformes, 2μ crassae, apicem versus haud incrassatae. Fig. 24.

In cortice *Quintiniae serratae* (*Saxifragaceae*), The Forks, Okarito, Westland, 21.4.1955, *Dingley* 19041 (typus).

Fig. 24 (on left). *Helotium quintiniae*. Habit sketch × 10, details × 660.

Fig. 25 (above). *Helotium subcinnabarinum*. Habit sketch × 12, details × 660.

The densely clustered apothecia suggest the presence of some kind of stroma within the bark but I can detect neither sclerotium nor black line in sections cut through the bark beneath the clusters. I am, therefore, constrained to refer the species to *Helotium* instead of to some genus of the *Sclerotiniaceae* as its appearance would at first sight suggest. *Pseudohelotium microcenangium* Penz. & Sacc. looks rather similar but with shorter stipe and apparently a different structure, 'contextu excipuli parenchymatico flavicante'.

Helotium subcinnabarinum *Dennis*, sp. nov.

Apothecia sparsa, stipitata, cinnabarina ('English Red' vel 'Dragon's Blood Red', Ridgway), cupula planiuscula, latit. 1–2 mm., stipes subaequalis, altit. 1–2 mm., deorsum leviter flocculosus. Asci cylindraceo-clavati, 70–80 × 6μ, octospori, obturaculo minimo jodo obsolete vel vix coerulescente; ascosporae ellipticae vel clavatae, 8–9 × 2–2·5μ; paraphyses gracilescentes, crassit 1·5μ. Fig. 25, p. 309.

Supra folia *Elaeocarpi dentati*, Harihari, Westland, 8.11.1954, *Dingley* 19052 (typus).

The structure is somewhat intermediate between that of an *Helotium* and a *Phialea*, with the flesh composed of slender interwoven hyphae with slightly gelatinised walls, the hyphae becoming almost parallel but still undulating at a low angle to the surface in the excipulum. The red pigment is unaffected by ammonia but completely decolorised by lacto-phenol.

Helotium subsordidum *Dennis*, nom. nov.

Helotium sordidum Phil. in Grevillea 15: 17 (1886) and Syll. Fung. 8: 238 (1889) *non H. sordidum* (Fuck.) Rehm in 26th Ber. naturh. Ver. Augsburg: 101 (1881).

Apothecia gregarious, superficial, disc concave, 2 mm. diameter, about Snuff Brown (Ridgway); receptacle smooth, saucer-shaped, concolorous or darker, with a slender cylindrical stalk, arising from a weft of white mycelium. Excipulum composed of parallel thin-walled hyphae, about 3μ wide, at a low angle to the surface. Asci cylindric-clavate, 85–90 × 6μ, 8-spored, pore not blued by Melzer's reagent; ascospores uniseriate, elliptical or somewhat pointed below, 7–8 × 4μ; paraphyses cylindrical, obtuse, 2μ wide. Fig. 26.

On decorticated wood, *Colenso* B313 (type).

Calycella brevispora (*Cooke & Phil.*) *Dennis*, comb. nov.

Helotium brevisporum Cooke & Phil. in Grevillea 8: 63 (1879).

On decorticated wood, Prov. Canterbury, 1860–61, *Sinclair & Haast* 8; Waitaki, *Berggren* 30B (type). Fig. 27A.

For description see Kew Bull. 13: 335 (1958).

Calycella citrina (*Hedwig ex Fr.*) *Boud.* in Bull. Soc. mycol. France 1: 112 (1885).

On unnamed wood, *Colenso* B673; on decorticated wood of *Griselinia littoralis* (*Cornaceae*), 750 m., Arthur's Pass, Canterbury, 17.1.1955, *Dingley* 19032; on *Nothopanax arboreum* (*Araliaceae*), 900 m., Taranaki, North Egmont, 26.3.1957, *Dingley* 19030.

Spores 8–12 × 3–4μ, ultimately 1-septate, asci 145–155 × 6μ, I+. Fig. 27B.

Calycella crocina (*Berk. & Curt.*) *Dennis*, comb. nov.

Peziza crocina Berk. & Curt. in Journ. Linn. Soc., Bot. 10: 369 (1868).
Helotium crocinum (Berk. & Curt.) Sacc., Syll. Fung. 8: 223 (1889).

On unidentified bark, Tuatapere, Alton valley, Otago, 17.4.1956, *S. D. & P. J. Brook* 19029.

Spores 13–19 × 3·5–4μ, nonseptate, asci up to 165 × 9μ, I—. Fig. 27C.

In Kew Bull. 9: 319 (1954) I treated this as a synonym of *C. citrina* (Fr.) regél. but examination of the abundant New Zealand material leads me to Quard it as separable by its more elongated nonseptate ascospores. It differs from *Helotium conscriptum* (Karst.) Karst. in its sessile apothecia as well as in its calycelloid excipulum.

Fig. 26 (above). *Helotium subsordidum*. Habit sketch × 15, details × 660.

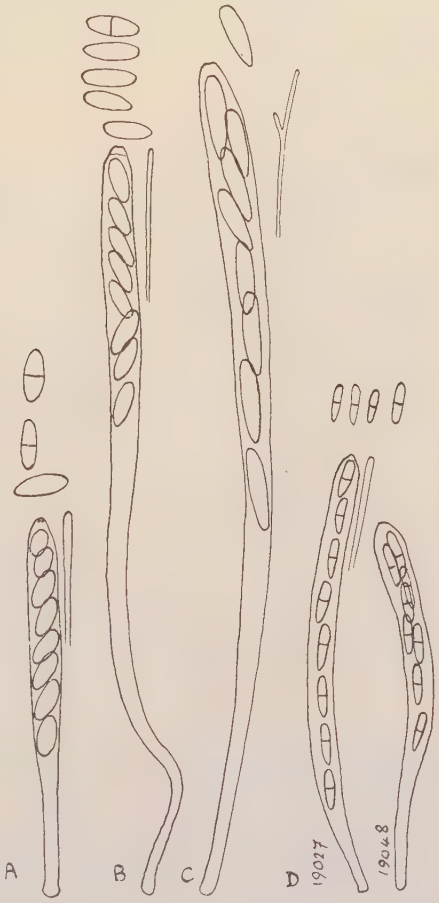


Fig. 27 (on right). Asci of New Zealand species of *Calycella* × 660. A. *C. brevispora*, B. *C. citrina*, C. *C. crocina*, D. *C. discedens*.

Calycella discedens (*Karst.*) *Dennis* in Kew Bull. 9: 320 (1954).

On *Coprosma grandifolia* (*Rubiaceae*), Atkinson's Park, Titirangi, Auckland, 27.6.1953, *Dingley* 19027; on *Muehlenbeckia australis* (*Polygonaceae*), Kauranga valley, Auckland, 10.6.1950, *Dingley* 19048.

The name is taken in the sense of *Dennis* 1954, viz. for sessile yellow apothecia with 1-septate ascospores 6–10 × 1·5–2·5μ in asci 75–90 × 4–6μ, I—. Fig. 27D.

Pezizella australis *Dennis*, sp. nov.

Apothecia conferta, subcaespitosa, sessilia, concaviuscula, albida vel albido pallescentia, disco 0·5 mm. lato. Asci clavati, octospori, 50 × 9μ, obturaculo minutissimo jodo coerulescentes; ascosporae distichae, cylindraceo-oblongatae, rectae vel curvulae, 9–11 × 2μ; paraphyses filiformes, gracillimae, subflexuosae, crassit. 1μ. Fig. 28.

In cortice *Quintiniae serratae* (*Saxifragaceae*), Harihari, Westland, 8.11.1954, *Dingley* 19037 (typus).

The structure is that of *Pezizella vulgaris* (Fr.) von Höhnel, but the ascospores are larger and the ascus-pore blued by iodine. *Pezizella sordidula* (Speg.) Sacc. on *Nothofagus* bark in Staten Island evidently differs in its smaller ascospores, 4–4·5 × 1·5μ.

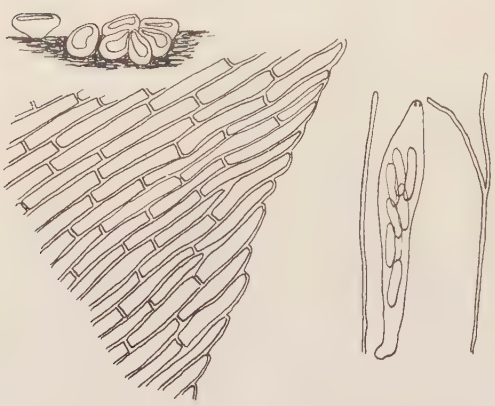


Fig. 28 (above). *Pezizella australis*. Habit sketch × 10, details × 660.

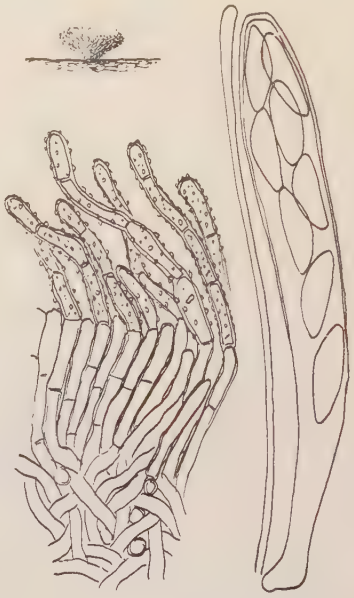


Fig. 29 (on right). *Chlorosplenium chrysotrichum*. Habit sketch × 8, details × 660.

Pezizella crispa (*Cooke & Phil.*) *Sacc.*, Syll. Fung. 8: 287 (1889).

Peziza (*Mollisia*) *crispa* Cooke & Phil. in Grevillea 8: 62 (1879).

Apothecia scattered, superficial, cupshaped, sessile, orange coloured throughout, disc concave when dry, flat and 2·5 mm. diameter when soaked up. Asci cylindric-clavate, 70–75 × 5μ, 8-spored, pore blued by Melzer's reagent; ascospores uniseriate, narrowly elliptical, 5–7 × 1·5–2μ; paraphyses cylindrical, obtuse, 1–1·5μ thick; marginal excipulum composed of small, short, prismatic cells 2μ wide, in rows at a low angle to the surface; flesh of large, angular, thin-walled cells, 10–15μ across, passing into a superficial zone of smaller rounded cells like those of an *Encoelia*. The yellow pigment is soluble in ammonia.

On wood, Maungaroa, *Berggren* 211 (type). Fig. 30.

Clearly this is not a *Pezizella* in the restricted interpretation of von Höhnel but is more like his *Orbiliopsis*.

Chlorosplenium aeruginascens (*Nyl.*) *Karst.* in Not. Sallsk. Faun. Flor. Fenn. 11: 233 (1870).

Ascospores 6–8 × 1μ, on green-stained wood, 600 m., *Podocarpus*-Rata forest, Pouakai, Egmont, 18.4.1960, *T. Taylor* s.n.

Chlorosplenium aeruginosum (*Oeder ex Fr.*) *de Not.* in Comm. Soc. Crit. Ital. 1: 376 (1864) *sensu* Nylander, Rehm, Korf *et al.*

Ascospores 11–14 × 3μ, on green-stained wood, Auckland, no date.

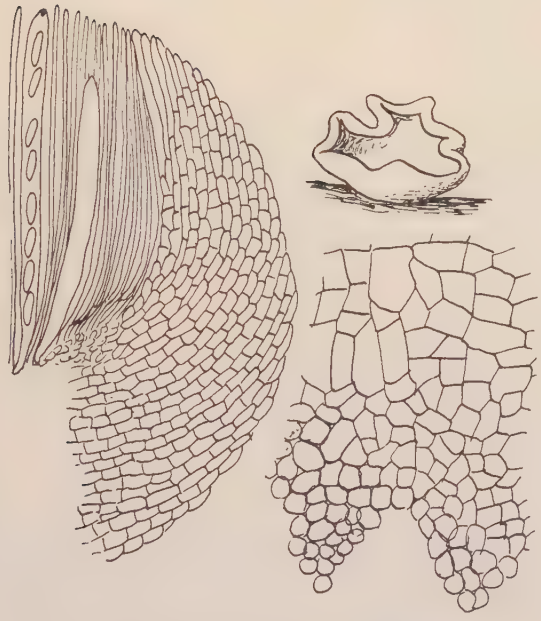


FIG. 30 (above). *Pezizella crispa.* Habit sketch of dry apothecium × 10, details × 660.

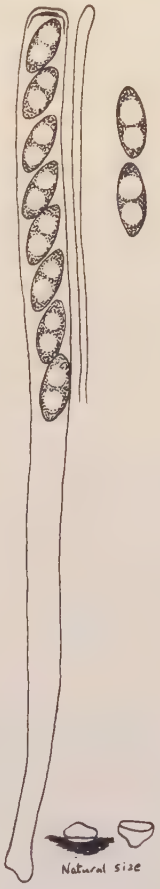


FIG. 31 (on right). *Discinella confusa.* Details × 660.

Chlorosplenium chrysotrichum (*Berk.*) *Dennis*, comb. nov.

Peziza chrysotricha Berk. apud Hook., Fl. Nov.-Zel. 2: 201 (1855).
Trichopeziza chrysotricha (Berk.) Sacc., Syll. Fung. 8: 411 (1889).

On twigs, shores of Waikare Lake, 1843, *Colenso* (type); York Bay, Wellington, 27.7.1923, *E. J. Butler* 1213 (immature), on *Nothofagus cliffortioïdes*, (*Fagaceae*), 780 m., Arthur's Pass, Canterbury, 16.1.1956, *Dingley* 19031.

This beautiful species was fully described by Massee (in Journ. Linn. Soc., Bot. 31: 517 (1896)), but its systematic position still presents some difficulty. It is not a *Trichopeziza* as typified by Saccardo but it agrees tolerably

in structure with the species of *Chlorosplenium* de Not. The asci, however, give a negative pore reaction with iodine and their spores are an odd shape for that genus. Fig. 29, p. 312.

Chlorosplenium rugipes (*Peck*) *Korf* in Bull. Nat. Sci. Mus. Tokyo 4: 391 (1959).

On unstained wood of *Weinmannia racemosa* (*Saxifragaceae*), Stewart I., 18.2. 1954, *Dingley* 19026.

Velutarina rufo-olivacea (*Alb. & Schw. ex Fr.*) *Korf* in Mycologia 45: 476 (1953).

On bark of *Beilschmiedia tawa* (*Lauraceae*), 360 m., Lake Rotoehu, Auckland, 17.10,1956, *G. H. Cunningham* 19024.

Discinella confusa *Dennis*, sp. nov.

Apothecia subgregaria, sessilia, ochracea, cupula planiuscula, pallida, 5 mm. lata, excipulo prosenchymatico. Asci anguste clavati, octospori, 170 × 8–9μ, obturaculo jodo coerulescente; ascosporae monostichae, fusoideae, biguttulatae, hyalinae, 13–15 × 5·5–6μ; paraphyses copiosissimae, filiformes, sursum levissime incrassatae, crassit. 2μ. Fig. 31, p. 313.

Supra virgultra putrida locis umbrosis, Orwel Creek, Ahaura, Westland, 26.4.1956, *Dingley* 19036 (typus).

The excipulum is composed of hyaline hyphae lying almost parallel to the surface. This collection seems to belong to the same species as one from Mt. Field, Tasmania, which Rodway referred to his *Cenangium recurvum* but which differs from the type of his fungus in its larger asci and ascospores and in its prosenchymatous excipulum.

Coryne cf. **tasmanica** (*Rodway*) *Dennis* in Kew Bull. 13: 347 (1958).

On rotting wood of *Fuchsia excorticata*, 900 m., Dawson Falls, Mt. Egmont, Taranaki, 28.1.1953, *Dingley* 19043; on unknown host, Black Gully, Tapanui, Otago, 19.4.1957, *S. D. & P. J. Brook* 19038.

These collections differ from the type in having the ascospores budding small, globose, secondary spores within the ascus, as in *C. cylichnium* (Tul.) Boud., from which they differ in the shorter ascospores.

Coryne rugipes *Cooke* in Grevillea 8: 58 (Dec. 1879).

Ombrophila rugipes (Cooke) Sacc., Syll. Fung. 8: 615 (1889).

This is a stilboid fungus with minute, slightly curved, hyaline conidia, 3–4 × 4μ. Cooke made this clear by listing the species next to *Dacrymyces* and apart from his list of Discomycetes and by his comment 'It is a *Coryne* as interpreted by Berkeley and not by Tulasne.' Nevertheless Saccardo has compiled the fungus among the Discomycetes which has led me to mention it here.

Velutaria nephrodigena (*Phill.*) *Sacc.*, Syll. Fung. 8: 488 (1889).

Peziza (*Dasyscypha*) *nephrodigena* Phill. in Grevillea 15: 17 (1886).

On fading fronds of *Rumohra hispida* (Sw.) Copel.

This is an epiphyllous lichen which has been kindly determined for me by Dr. R. Santesson as *Bacidia subundulata* (Stirt.) R. Sant. The species is peculiar in developing its apothecia on the opposite side of the leaf from its vegetative thallus so it is not surprising Phillips took it for a nonlichenised fungus. The pruinose character of the excipulum presumably led to the transfer to *Velutaria*.

Pseudohelotium juncicola *Dennis*, sp. nov.

Apothecia gregaria, sessilia, erumpentia, leviter puberula, albida, disco flavescente, margine integra, latit. 0·5 mm. Asci clavati, octospori, 100 × 13μ, apice jodo non tincti; ascosporae fasciculatae, cylindraceo-clavatae, 3-septatae, hyalinae, 40 45 × 4μ; paraphyses filiformes, subinde dichotome ramosae, apice paullo incrassatulo, crassit. 1–3μ. Fig. 32.

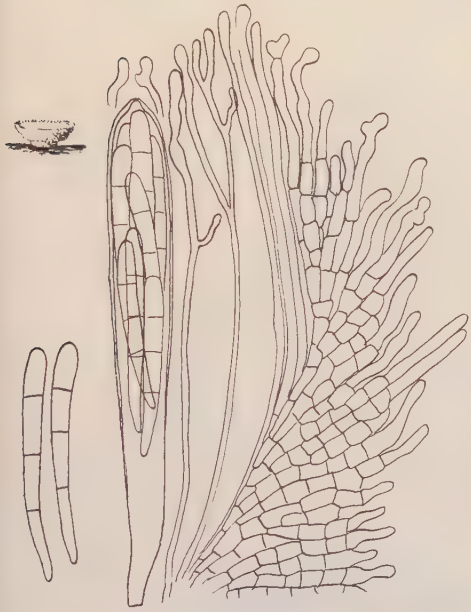


Fig. 32. *Pseudohelotium juncicola*. Habit sketch × 15, details × 660.

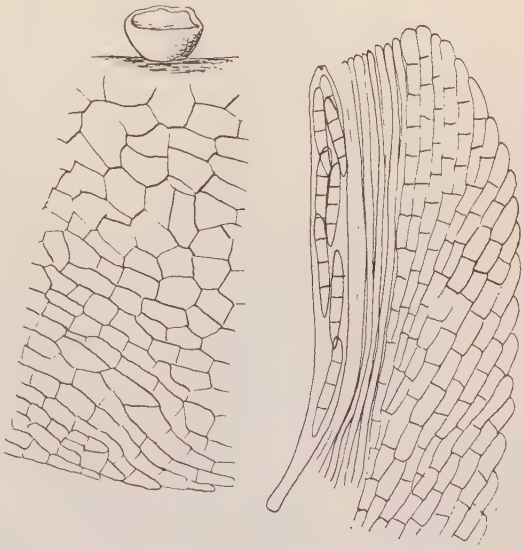


Fig. 33. *Pseudohelotium haematoïdeum*. Habit sketch × 8, details × 660.

In foliis vetustis *Junci vaginati*, Upper Hutt, Hutt River, Wellington, 31.7. 1952, *A. J. Healey* 19045 (typus).

Excipulum composed of rows of short prismatic cells, 3–4μ wide, at a high angle to the surface and running out into short, cylindrical, nonseptate, smooth, hyaline, obtuse hairs.

Pseudohelotium haematoïdeum (*Cooke & Phil.*) *Dennis*, comb. nov.

Peziza (*Mollisia*) *haematoïdea* Cooke & Phil. in Grevillea 8: 62 (1879).
Pezizella haematoïdea (Cooke & Phil.) Sacc., Syll. Fung. 8: 284 (1889).

Apothecia scattered, subsessile, superficial, smooth, orange coloured throughout, disc concave, 1·5 mm. across, margin obtuse, even. Excipulum composed of rows of short, thin-walled, prismatic cells, 3–4μ wide, lying at a low angle to the surface, flesh formed of similar but larger angular cells;

asci cylindric-clavate, 8-spored, 90 × 7μ, the small pore blued by Melzer's reagent; ascospores biseriate, fusiform, 1- then 3-septate, 16–21 × 2·5μ; paraphyses filiform, obtuse, 2μ wide. Fig. 33, p. 315.

On decorticated wood, Waitaki, *Berggren* 100 (type).

I do not know a fully appropriate genus for this little fungus. In most systems it will key to *Belonidium* but the type of that, *B. aeruginosum* Dur., is a *Dasyscyphus*. *Podobelonium* (Sacc.) Sacc. at first sight appears to offer a solution but of its four foundation species two belong to *Belonioscypha*, one to

Fig. 34. *Eutryblidiella torulispora*. Habit sketch × 8, details × 660.

Strossmayeria and the fourth, *Helotium capense* Cooke & Kalchbr., appears to me to be a typical *Helotium*. Actually *P. haematoïdea* seems nearest to *Orbiliopsis* von Höhnel but that name is unfortunately unavailable since it is a later homonym of *Orbiliopsis* Sydow. *Pseudohelotium* offers a reasonable place for the species but it differs from *P. pineti* in its smooth receptacle, more waxy texture and probably unbranched paraphyses.

Eutryblidiella torulispora (*Phil.*) *Dennis*, comb. nov.

Patellaria torulispora Phil. in Grevillea 15: 16 (1886).
Karschia torulispora (Phil.) Sacc., Syll. Fung. 8: 781 (1889).

Apothecia crowded, often mutually deformed, sessile, erumpent from bark, disc flat, dark purplish brown drying black, 1–3 mm. across, orbicular to elliptical or irregular, with a prominent obtuse margin when dry; receptacle smooth and black. Excipulum composed of parallel short-celled hyphae, 4–5μ wide, with thin purplish brown walls, lying almost at right angles to the surface, the terminal cells black and opaque. Asci narrowly cylindric-clavate, 140 × 5–6μ, apex flattened, not greatly thickened, not blued by Melzer's reagent; ascospores uniseriate, 1-septate and constricted at the septum, dark brown, 12–13 × 3·5–4·5μ; paraphyses cylindrical, obtuse, 3μ wide, hyaline, firmly coherent. Fig. 34.

On bark of unknown trees, *Colenso* B144 (type); 270 m., Tauperi Mt., Auckland, 27.11.1954, *Dingley* 19025.

The narrowly cylindrical asci with negative iodine reaction are not those of a *Karschia*.

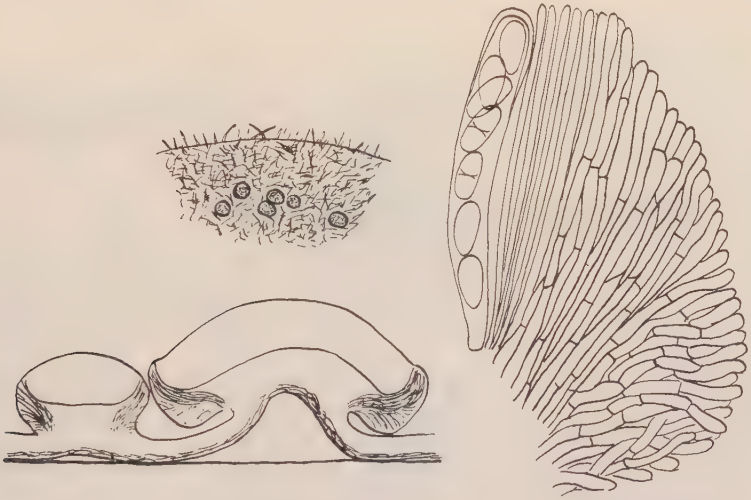


Fig. 35. *Ephelina gregaria*. Portion of leaf bearing apothecia × 5, diagrammatic section × 60, with brown tissue shaded, section of margin × 660.

Ephelina gregaria (*Berk.*) *Sacc.*, Syll. Fung. 8: 586 (1889).

Excipula gregaria Berk. apud Hook., Fl. Nov.-Zel. 2: 202 (1855).
Pseudopeziza gregaria (Berk.) Massee in Journ. Linn. Soc., Bot. 35: 113 (1901).

Apothecia gregarious, sessile on a superficial epiphyllous thallus, discoid, black throughout when dry, disc convex, 0·5 mm. across, dingy yellow with a brown margin when soaked up; receptacle smooth. Excipulum composed of parallel, septate, brown hyphae, 3μ wide, paler and more irregularly disposed towards the surface; thallus of interwoven brown hyphae like those of the excipulum, algal cells not seen. Asci cylindric-clavate, 8-spored, rather thick-walled, 75 × 10μ (100 × 9–10μ, Massee), apex rounded, not blued by Melzer's reagent; ascospores uniseriate or irregularly biseriate above, ovoid, 11–13 × 4–5μ, with 2–3 oil bodies, hyaline, perhaps eventually 1-septate; paraphyses hyaline, cylindrical, apex rounded, about 2μ wide. Fig. 35.

'On the upper surface of the living leaves of some *Gnaphalium*', *Colenso* s.n. (type).

Neither the superficial habit not the prosenchymatous excipulum support Massee's interpretation of this as a *Pseudopeziza* and I cannot at present improve on Saccardo's disposition of it.

PATELLARIACEAE

Patellaria atrata [*Hedwig*] *Fr.*, Syst. mycol. 2: 160 (1822).

Lichen atratus Hedwig, Descript. Musc. frond. 2: 61 (1789).
Lecanidion australe Speg. in An. Mus. Nac. Buenos Aires 23: 104 (1912).

On dead bark, *Colenso* s.n., unlocalized.

The New Zealand and Argentine collections agree precisely and only differ from European material in their slightly shorter asci, 110–120 × 18–21μ as compared with 120–150 × 18–20μ (Rehm) or 150–175 × 18–20μ (Boudier).

FIG. 36. *Rhagadolobium bakerianum*. Section of inner margin × 660, habit sketch × 10, diagrammatic median vertical and horizontal sections × 30, fertile areas stippled, sterile tissue black.

POLYSTOMELLACEAE

Rhagadolobium bakerianum *Sacc.* in Nuovo Giorn. Bot. Ital. 23: 206 (1916).

Ascomata solitary or in small clusters, black, irregular but ± cupshaped with inrolled margin when dry, 1–2 mm. across, margin split into numerous short, thick, obtuse lobes; hymenium exposed on the inner surface of the ascoma, annular, surrounding a central sterile area which tends to be depressed or may be perforate. Flesh a homogeneous tissue of reddish-brown, agglutinated, ± isodiametric cells; basal and marginal tissue composed of similar but more prismatic cells arranged in rows almost at right angles to the surface. Asci cylindric-clavate, 8-spored, short-stalked, apex rounded and thickened, without a visible pore, 70–85 × 11–13μ; ascospores elliptical to ovoid, scarcely constricted at the median septum, hyaline,

ultimately becoming pale brown, 12–15 × 5–7μ, interascal hyphae cylindrical, septate, not much longer than the asci, apex rounded, up to 5μ wide, strongly agglutinated. The whole hymenium turns blue with iodine. Fig. 36.

On the lower surface of pinnules of *Cyathea dealbata*, Little Barrier I., Auckland, 5.10.1945, *Dingley* 19035.

The type was on *Cyathea caudata* in the Philippines. *Rh. hemitheliae* P. Henn. & Lind., the type-species of the genus, on *Hemithelia samoënsis* in Upulu, apparently differs in its smaller ascospores, 8–10 × 3·5–4μ.

MYRIANGIACEAE

Gloeodiscus *Dennis*, gen. nov.

Ascomata epiphylla, superficialia, atra, mycelio fusco circumdata, gelatinosa, primum clausa, dein in lacinias obtusas incisas dehiscentia; asci octospori, ascosporae hyalinae, murali-divisae.

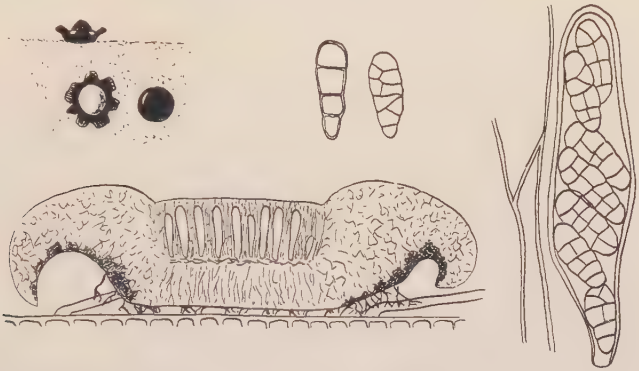


Fig. 37. *Gloeodiscus nigro-rufus*. Habit sketch × 8, diagrammatic section × 100, spores and ascus × 660.

Gloeodiscus nigro-rufus (*Berk.*) *Dennis*, comb. nov.

Excipula nigro-rufa Berk. apud Hook., Fl. Nov.-Zel. 2: 202 (1855).
Scleroderris nigro-rufa (Berk.) Sacc., Syll. Fung. 8: 598 (1889).

Ascoma about ½ mm. diameter, when dry closed and black, when moistened opening by the folding back of from 4 to 7 lobes to expose a yellowish-brown gelatinous disc. Sterile tissue composed of an open network of hyaline hyphae 1μ wide, encrusted towards the surface with opaque brown matter, embedded throughout in a hyaline gelatinous substance. Fertile area a hymeniform layer of clavate, rather thick-walled, 8-spored asci, about 70–80 × 15–17μ; ascospores elliptic-cylindric, hyaline, 16–20 × 6–7μ, at first 3-septate, then with up to 5 transverse septa and 1–2 longitudinal septa; interascal hyphae 1μ wide, anastomosing. No part of the tissue stains blue with Melzer's reagent. Fig. 37.

Seated on the hairs of *Pittosporum crassifolium* leaves, near the river Te Waiohingaonga, Hawkes Bay, *Colenso* (type).

This fungus seems to be akin to *Phycopsis* and *Zukaliopsis*, with structure resembling the former and asci more like the latter. *Ekmanomyces* Pet. & Cif has similar but blackish-brown dictyospores. *Protoscypha* Sydow. has similar asci and ascospores but is erumpent and non-gelatinous.

Dermatea fumosa *Cooke & Phil.* in Grevillea 8: 64 (1879).

Ascomata scattered, erumpent, sessile, orbicular, 2–4 mm. diameter; disc flat, brown, pruinose, whitish with extruded spores when dry; receptacle dark brown, pruinose, composed of tightly woven hyphae, 1–2μ wide, mingled with small subglobose cells. Ascogenous layer soft, ochraceous in section; flesh white, formed of slender, matted, hyaline hyphae; basal layer black, composed of larger black-walled cells, rooting in the wood. Asci clavate, thick-walled, very long-stalked and maturing at different levels, up to 250 × 18–20μ, not blued by Melzer's reagent; ascospores 1–2-seriate in the ascus tip, elliptic-fusiform, hyaline, 24–32 × 4–6μ becoming 3-septate and budding shortly elliptical, hyaline, secondary spores 2·5–4 × 1·5–2μ after being extruded from the asci; interascal hyphae slender, hyaline, branched, 1μ wide. Fig. 38.

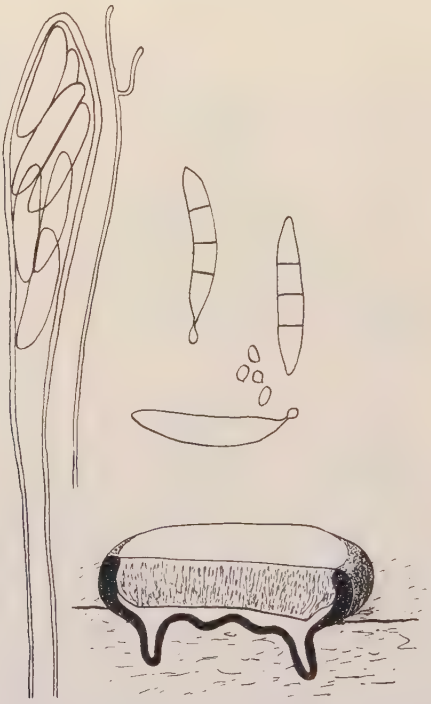


Fig. 38. *Dermatea fumosa.* Habit sketch of ascoma, sliced open vertically, × 10, details × 660.

On rotten wood, Dunedin, *Berggren* 207 (type).

This certainly bears no resemblance to a *Dermea*, nor to any genus of *Dermateaceae*. In structure it recalls such genera as *Phacidiella*, *Propolis*, *Cryptomyces*, *Cryptodiscus* and *Agyriella* Ell. & Ev. (=*Bisbyella* Boed.), especially the last named in which the long asci become packed with secondary spores. Its true systematic position is not clear to me, however, and I prefer not to propose any transfer for the species at present.

Toward a fuller description of the *Bambusoïdeae (Gramineae)*

F. A. McClure (Smithsonian Institution)*

This paper is an initial contribution toward the discharge of a responsibility entrusted to the writer (at the suggestion of the late Dr. Robert Pilger) by Dr. H. Melchior of the Botanisches Museum, Berlin-Dahlem: the preparation of a revision of the genera of the *Bambusoïdeae*, for the new edition of Engler & Prantl, 'Die Natürlichen Pflanzenfamilien'.

Gramineae subfam. **Bambusoïdeae** *Rehd.* in Journ. Arn. Arb. 26: 78 (1945); Bibl. Cult. Trees Shrubs: 635 (1949); Pilger in Engl., Bot. Jahrb. 76: 290 (1954); Y. L. Keng (ed.), Fl. Ill. Pl. Prim. Sin. Gram.:1 et sq. (1959).

Gramina subfam. *Bambusoïdeae* Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 769 (1902); Prat in Ann. Sci. Nat., sér. 10, Bot., 18: 217 (1936).

Gramineae tribe *Bambuseae* Nees, Agrost. Bras.: 520 (1829); Ruprecht, Bamb. Mono. Exp.: 1 (1839); Benth. in Benth. & Hook.f., Gen. Pl. 3: 1094 (1883); Camus, Les Bamb.: 15 (1913); Hubb. in Hutch., Brit. Fl. Pl.: 300–304 (1948).

Gramina Class X. *Bambusacea* Kunth in Mém. Mus. Hist. Nat. 2: 75 (1815).

Bambusaceae Link, Hort. Reg. Bot. Berol. 2: 308 (1833); Trinius in Mém. Acad. Petersb., sér. 6, Sci. Nat. 3(2): 613 (1835); Munro in Trans. Linn. Soc. Lond. 26: 10 (1868); Nakai, Flora Sylv. Koreana 20: 12 (1933).

Perennial plants with initiation of new vegetative growth in some conditions continuous, typically seasonal, in hardy species either vernal, aestival or autumnal. Insertion of buds and foliar structures distichous, alternating at successive nodes of segmented axes; insertion of adventitious roots circumaxial, primarily at the nodes of rhizomes and the lower nodes of culms. All vegetative axes more or less strongly lignified (weakly so in some taxa). Individual plants spreading by a branching system of rhizomes. Rhizomes generally within a given genus consistently pachymorph or leptomorph, rarely appearing in either one form or the other in different species of the same genus, and more rarely manifesting both forms in the same plant; giving rise to culms in either caespitose or diffuse array. Buds at rhizome nodes prophyllate, solitary; branches of the rhizome solitary. Culms perennial, in some species very short-lived; ranging in length (by species, and in plants of mature stature) from 0·15 to 45 meters; of diverse habit: self-supporting, reclining or reclinate, clambering (often by means of special morphological adaptations) or twining (by circumnutation in growing shoots); unbranched in part (at lower or mid-culm nodes or both) or, in some species, remaining either temporarily or permanently unbranched throughout in the vegetative state. Each node of every segmented axis marked either solely by the locus of insertion of a sheath, or in some cases

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also by an encircling ridge at the level of the insertion of a bud or a branch complement. Branch buds at culm nodes prophyllate, uniformly solitary in most genera (more than one in all species of the genus *Chusquea*), the bud scales (prophylla of branch buds) 2-keeled and completely amplexicaul to the branch primordium, or 1-keeled and incompletely amplexicaul. Lower and mid-culm nodal ridges in some species bearing a ring of more or less thorn-like adventitious roots in arrested development. Branches at culm nodes usually unarmed, in some species more or less strongly thorny, the thorns dwarfed and indurated branches. Branch complement at mid-culm nodes monoclade or pleioclade; component initial axes in pleioclade branch complements either subequal or unequal, the primordial branch in the latter case more or less strongly dominant; the branch complement at mid-culm nodes either remaining static basally after the completion of the initial grand period of growth or, more commonly, augmented by the subsequent germination of buds basal to one or more of the branches. Culm internodes often sulcate for a greater or lesser distance above the insertion of a bud or a branch complement, rarely squarish in cross-section, otherwise cylindrical or nearly so; either efistulose with a pithy center, or fistulose, the fistula containing pith in diverse forms and in different degrees of abundance; fibrovascular bundles crowded toward the periphery of the culm, progressively more widely spaced toward the center; internodes below the middle of the culm increasing in length, those above the middle decreasing in length and diameter, acropetally. Each node of every segmented axis bearing a sheathing foliar organ (sheath). Sheaths proper laminiferous, awned or apiculate; all apically ligulate, the ligule in some species obsolete or subobsolete. Culm sheaths and branch sheaths more or less strongly differentiated from the leaf sheaths in features that include shape, texture and locus of insertion of the sheath proper, and the form and aestivation of the blade; culm sheaths and branch sheaths always inserted on their respective axes at levels proximal to leaf sheaths, persistent or abscissile, culm sheaths in some species incompletely abscissile, the lowest ones bladeless, the upper ones laminiferous; the blades sessile, during development imbricately disposed upon the axis of their common origin, a midrib sometimes weakly developed, usually lacking. Leaf sheaths borne at the distal nodes of aerial axes of all orders; normally deeply imbricate and persistent. Leaf blades petiolate and usually abscissile at length between the petiole and the sheath, more persistent in species with unbranched culms (as in *Neurolepis*); during development tightly rolled individually and parallel to the midrib, each with one margin at the center of its roll—rarely manifesting plicate vernation; afterward usually flat or nearly so, rarely plicatile, aciculiform or quilled (as in *Arthrostylidium capillifolium*); a midrib always distinguishable. Parallel veins of all sheath blades and leaf blades (as far as known) connected by transverse veinlets, these weakly to strongly manifest on one or both surfaces, or entirely obscured to superficial view by overlying tissues. Foliage in plants with branched culms renewed continuously or periodically (commonly once a year) by the germination of buds at subdistal nodes of branches, giving rise to leafy twigs replacing those lost by abscission; the renewal of foliage generally more or less markedly diminished or stopped completely upon the initiation of flowering.

Inflorescences consistently of either determinate or indeterminate branching within a given genus, terminal or lateral to vegetative axes. Leafless

flowering branches with or without associated sterile foliage-bearing branches on the same culm. Determinate inflorescences pedunculate, the branching paniculate, racemose or spicate, usually symmetrical, rarely secund; indeterminate inflorescences generally sessile or subsessile pseudospikelets, these often forming more or less dense tufts or heads. Spikelets sessile or pedicellate, one–many-flowered, terminating in either a functional floret, a sterile floret, or a prolongation of the rachilla usually bearing a rudiment at its tip; the lowermost floret usually preceded by one–several empty glumes, these unequal, increasing in size acropetally, commonly two, one or both rarely lacking or obsolete. Rachilla segments in several-flowered spikelets short and not disarticulating between florets or, more commonly, more or less elongate and abscissile below the lemma of each functional floret. Lemmas of completely or incompletely amplexicaul insertion; usually apiculate or awned; the margins either not convolute above (the florets then either open or closed at anthesis), or convolute and more or less tightly enrolling the palea except for an aperture at its very apex in functional florets (the florets then not opening at anthesis). Palea in functional florets dorsally sulcate or canaliculate throughout from base to tip or sulcate only near the apex; in some conditions without dorsal concavity; either incompletely amplexicaul at the base and open above, or completely amplexicaul at the base with the margins overlapping above and enclosing the floral parts entirely, leaving a small aperture at the apex only. Flowers generally hermaphrodite, the androecium or the gynoecium in some conditions rudimentary or lacking entirely in part or all of the florets of a given spikelet. Lodicules in some species lacking, in others variable in number, in most species 3, all alike in some species, more or less strongly unequal and unlike in others, the anterior two usually asymmetrical and paired, the posterior one symmetrical, sometimes lacking; all thin and translucent in some species, somewhat thickened and opaque in others, glabrous or pubescent abaxially, the margin usually ciliate above, rarely glabrous. Stamens usually 3 or 6 (varying between 3 and 6 in some species; 6 many in *Ochlandra*) typically in whorls of 3; the anthers generally yellow or greenish yellow, rarely maroon when fresh and afterwards brown; the filaments threadlike and free, or flat and either triadelphous or diadelphous, or all lightly connate—in some species monadelphous (fused below in a delicate tube, as in *Gigantochloa*). Anthers at first 4-locular, the two locules of each pair uniting upon the maturation of the pollen sac then opening by an apical pore or by a slit following the suture; the connective in some species exserted above the insertion of the pollen sacs in a glabrous or penicillate point. Ovary normally solitary (sometimes duplicated in teratological flowers), one-celled with one ovule, and terminating above in 1–3 styles (most commonly 3 or 2) these (when more than one) united at the base and upward for a distance varying with the species in some genera, in others uniform; proliferations of the stigmatic surface generally uniform within a genus, of diverse character and arrangement within the subfamily, usually white, in some species purple or red. Fruit sessile, rarely stipitate, usually falling with the floral envelope still attached basally; widely variable in size, shape and structure, and in the character and thickness of the pericarp; always one-seeded and indehiscent, in most genera a caryopsis; the endosperm starchy and firm or friable; the embryo relatively short-lived, in some genera apparently lacking a dormant stage.

Sexual reproduction monocarpic or polycarpic. Flowering cycle, according to numerous but mostly weakly documented records, varying (as between species) from one to 60 years or more in length. Flower production commonly gregarious, sometimes erratic as to timing and sometimes involving only part of the plants, or only part of the culms in individual plants, of a given seedling population; flowering sometimes continuous for 5–15 years of a given cycle in some polycarpic species, full vegetative vigor being restored gradually as flower production subsides. Fruit production abundant to sparse or nil—self sterility apparently common in some species.

TYPE: *Bambusa* Retzius* (orth. mut. Schreber); *B. arundinacea* Retz. About 50 genera.

Pelargoniums and Fuchsias.†—Years of practical experience have enabled the author to write this little book on the cultivation of these interesting plants. Part 1 deals with Pelargoniums and part 2 with Fuchsias. Information is given on their culture, uses, pests, and diseases, exhibiting and hybridizing, and lists of species and varieties.

H. S. MARSHALL

Drawings of British Plants.‡—Part XIV of this fine publication, which covers the *Adoxaceae*, *Caprifoliaceae*, *Rubiaceae*, *Valerianaceae* and *Dipsacaceae* acccording to Bentham and Hooker's arrangement save for the elevation of the first-named to family rank, maintains all the care and consistency of the previous parts. Contrasted with other drawings of the British flora appearing currently it is an object lesson in the sheer necessity of giving the artist room in which to work, and the lifelike appearance of many species is remarkable; the painstaking detail of the inflorescence of *Sambucus nigra* L., the way the leaves of *Galium boreale* L. droop at the tips, and the 'leafy' appearance of the inflorescence of *Valerianella carinata* Lois, so often missed in illustrations, are examples. If omissions of established aliens must be made, then they have been rightly selected. Do some of the differences implied from the drawing between *Galium mollugo* L. subspp. *mollugo* and *erectum* truly exist? The fact that Clapham, Tutin & Warburg (Fl. Brit. Isles 991, 992: 1952) describe the petals of the former as 'cuspidate' and the latter 'long-cuspidate', whereas Miss Ross-Craig reverses these, tends to confirm the suspicion that they do not. The drawing of *G. palustre* L. seems to be of subsp. *elongatum* (C. Presl) Lange rather than subsp. *palustre*, and note could have been made of this. But if a reviewer's livelihood depended on finding criticisms of Miss Ross-Craig's work, how poverty stricken he would be!

C. C. TOWNSEND

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* See McClure in 'Taxon' 6: 201 (1957).

† *Pelargoniums and Fuchsias.* 'Amateur Gardening' Handbook No. 34. By A. G. Puttock. Pp. 92, 16 line-drawings. London: W. H. & L. Collingridge Ltd., 1959. Price 4s.

‡ *Drawings of British Plants*, Part XIV, Adoxaceae to Dipsacaceae. By Stella Ross-Craig. 14 black & white plates. London: G. Bell & Sons Ltd., 1960. Price 10s. 6d.

New species of *Zornia (Leguminosae)* from Africa

ROBERT H. MOHLENBROCK
(Southern Illinois University, Carbondale)

While revising the leguminous genus *Zornia* of the World, the writer has found a number of previously undescribed species. In this paper are described those new species from the African mainland and from Madagascar.

Mr. E. Milne-Redhead of the Royal Botanic Gardens, Kew, who so ably unravelled *Zornia* of Tropical Africa (1954), has abetted this study immeasurably by arranging for critical specimens to be sent on loan to Illinois by his Director, whose help the author wishes to acknowledge. The author is also indebted to Mrs. Nancy MacMahon who provided the drawings.

Zornia milneana *Mohlenbrock*, sp. nov.

Herba perennis, prostrata vel suberecta, usque 75 cm. longa, caulibus ramosis punctatis glabris vel puberulis. *Foliola* 4, lineari-lanceolata, raro linearia vel ovata, acuminata, usque 40 mm. longa, 5 mm. lata, punctata, glabra, 1-nervata; petiolus quam foliola saepe brevior, punctatus, puberulus; petiolulus villosus; stipulae punctatae, fere glabrae, 5–7-nervatae. *Inflorescentia* apice subcongesta; bracteae ovatae, acuminatae, usque 12 mm. longae, 7 mm. latae, punctatae, glabrae, 5–7-nervatae, infra basim in calcar usque 3·5 mm. longum productae. *Calycis lobi* postice alte connati, obtusi, circiter 4 mm. longi, strigosi, 5-nervati; lobus anticus acutus, circiter 4 mm. longus; lobi laterales acuti, circiter 2·5 mm. longi. *Corolla* lutea, vexillo usque 12 mm. longo, alis et carina falcatis. *Lomentum* e bracteis exsertum, 4–5-articulatum, articulis 2·7–3·0–(3·5) mm. longis, 2·5–2·7 (–3·0) mm. latis haud reticulatis puberulis vel glabris glandulosis vel eglandulosis setiferis, setis 0·5–1·0 mm. longis, pilis retrorsis praeditis. Fig. 1, p. 326.

TYPE: Southern Rhodesia, Matopos District, *D. C. Plowes* 1410 *in Gov. Herb.* 35838 (K).

MOZAMBIQUE: Inharrime–Nhacoongo, *Pedro* 277 (SRGH).

SOUTHERN RHODESIA. Hartley District, Poole, *Hornby* 2871 *in Gov. Herb.* 20225 (K, SRGH). Inyanga District, *Hopkins* 154 (SRGH), *Hopkins in Gov. Herb.* 7858 (K, SRGH), *Chase* 604 *in Gov. Herb.* 19905 (F, K). Makoni District, Inyazura, *Hopkins in Gov. Herb.* 9740 (K). Marandellas District, Injima, *Collins* 18 (SRGH) & *Collins in Gov. Herb.* 14489 (K), *Corby* 619 *in Gov. Herb.* 29617 (K); Nyamandkloon, *West* 3203 (K, SRGH), 3136 (K, SRGH). Matopos District, Mtsheleli Valley, *Plowes* 1410 *in Gov. Herb.* 35838 (K, holotype). Matobo District, *O. B. Miller* 2050 *in Gov. Herb.* 45123 (K, SRGH), 2169 *in Gov. Herb.* 45947 (K, SRGH), 3981 (K). Salisbury District, Cleveland Dam, *Brain* 7546 (SRGH), Hunyani, *Wild* 3229 *in Gov. Herb.* 26905 (K), Chindamora, *R. M. Davies* 508 *in Gov. Herb.* 43194 (K, SRGH). Shangani District, *Goldsmith* 6/55 (K, SRGH). Umtali District, *Chase* 5967 (SRGH), *Teague* 434 (K), Melsetter, *Williams* 151 (SRGH). Kobila, *O. B. Miller* 1542 (SRGH). Bulawayo, *F. A. Rogers* 13813 (K), *Monro* 908 (K).

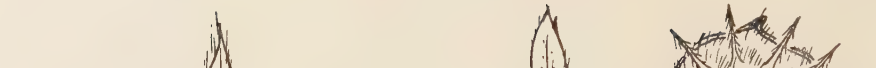

Fig. 1. *Zornia milneana*. 1, upper portion of plant showing inflorescence and leaves, × 2; 2, bract, × 10; 3, fruit, × 10; 4, leaf from form with broad leaflets, × 2. 1–3 from *Wild* 3229; 4 from *Merxmüller* 1226.

Northern Rhodesia. Livingstone, *Gilges* 528 (SRGH), *F. A. Rogers* 7049 (K), *Robinson* 1437 (K); Mazabuka*, *Robinson* 2028 (K, SRGH); Namwala, *Robinson* 2056 (K).

Bechuanaland Protectorate. Mochudi, *F. A. Rogers* 6877 (FI).

Angola. Imbaca, *Welwitsch* 2116** (P).

South West Africa. Gobabis, *de Winter* 2446 (K), *Merxmüller* 1226 (K); 160 miles [256 km.] E. of Grootfontein, *Story* 6245 (K); Okavango, *Dinter* 4561 (GH), *de Winter* 3929 (K); Otjiwarongo, *de Winter* 2772 (K); Windhoek District, 57 miles [93 km.] SSW. of Steinhausen, *de Winter* 2418 (K).

Transvaal. Lydenburg, *Wilms* 352 (P); Magaliesberge, *Burke* (K), *Zeyher* 467 (K, P), *Schlieben* 7763 (K); Pretoria, Pienaas River, *Merxmüller* 196 (K); Rietondale, *Trapnell* 615 (K); Zeerust, *Thode* A1396 (K).

Natal. Hla bisa, *Ward* 1865 (SRGH).

Cape Province. Bechuanaland, 96 km. NW. of Vryburg, *Rodin* 3510 (K, US).

This very distinct species has long been confused with *Z. capensis* Pers., either under the name of the latter or under *Z. tetraphylla* Michaux, a binomial which does not apply to African material.

Zornia milneana is a perennial species characteristic of the sandy grasslands of southern Africa. Its geographical distribution is confined between latitudes 15° and 28° S.

This species is recognised by its four leaflets, its rather crowded inflorescence, and its large, usually eglandular loments with numerous retrorsely hairy bristles. Leaflet-shape is variable, with some specimens bearing linear leaves very reminiscent of *Z. linearis* E. Mey. *Zornia milneana* is easily distinguished from the heavily glandular-dotted, non-bristly loments of *Z. capensis*.

The epithet commemorates Mr. E. Milne-Redhead who is a keen student of the African flora.

Zornia albolutescens *Mohlenbrock*, sp. nov.

Herba perennis, erecta, usque 50 cm. alta, caulibus ramosis villosis. *Foliola* 2, oblongo-lanceolata, acuta, usque 25 mm. longa, 7 mm. lata, parce punctata, villosa, 1-nervata; petiolus quam foliola saepe brevior, villosus; petiolulus villosus; stipulae punctatae, parce villosae, 5-nervatae. *Inflorescentia* apice subcongesta; bracteae ovato-lanceolatae, acutae, usque 9 mm. longae, 5 mm. latae, punctatae, parce villosae, ciliatae, 6-nervatae, infra basim in calcar usque 1 mm. longum productae. *Calycis lobi* postice alte connati, obtusi, circiter 3 mm. longi, parce strigosi, 5-nervati; lobus anticus acutus, circiter 3 mm. longus; lobi laterales acuti, circiter 2 mm. longi. *Corolla* lutea, vexillo usque 10 mm. longo, alis et carina falcatis. *Lomentum* 5-articulatum, articulis 1·7 mm. longis 1·8 mm. latis reticulatis glabris glandulosis haud vel parce setiferis, setis 0·1 mm. longis glabris. Fig. 2, p. 328.

* The Kew sheet of this No. is stated to have come from Maala, 80 miles [128 km.] N. of Choma.

**According to Cat. Afr. Pl. Welw. 1: 239–240 (1896) the only 4-leafleted species of *Zornia* collected by Welwitsch is his No. 2116 which came from 'Plateau of Empalanca, Huilla.' His *Zornia* from 'Ambaca' [in Cuanza Norte] is No. 2115 cited under *Z. diphylla* Pers.—Ed.

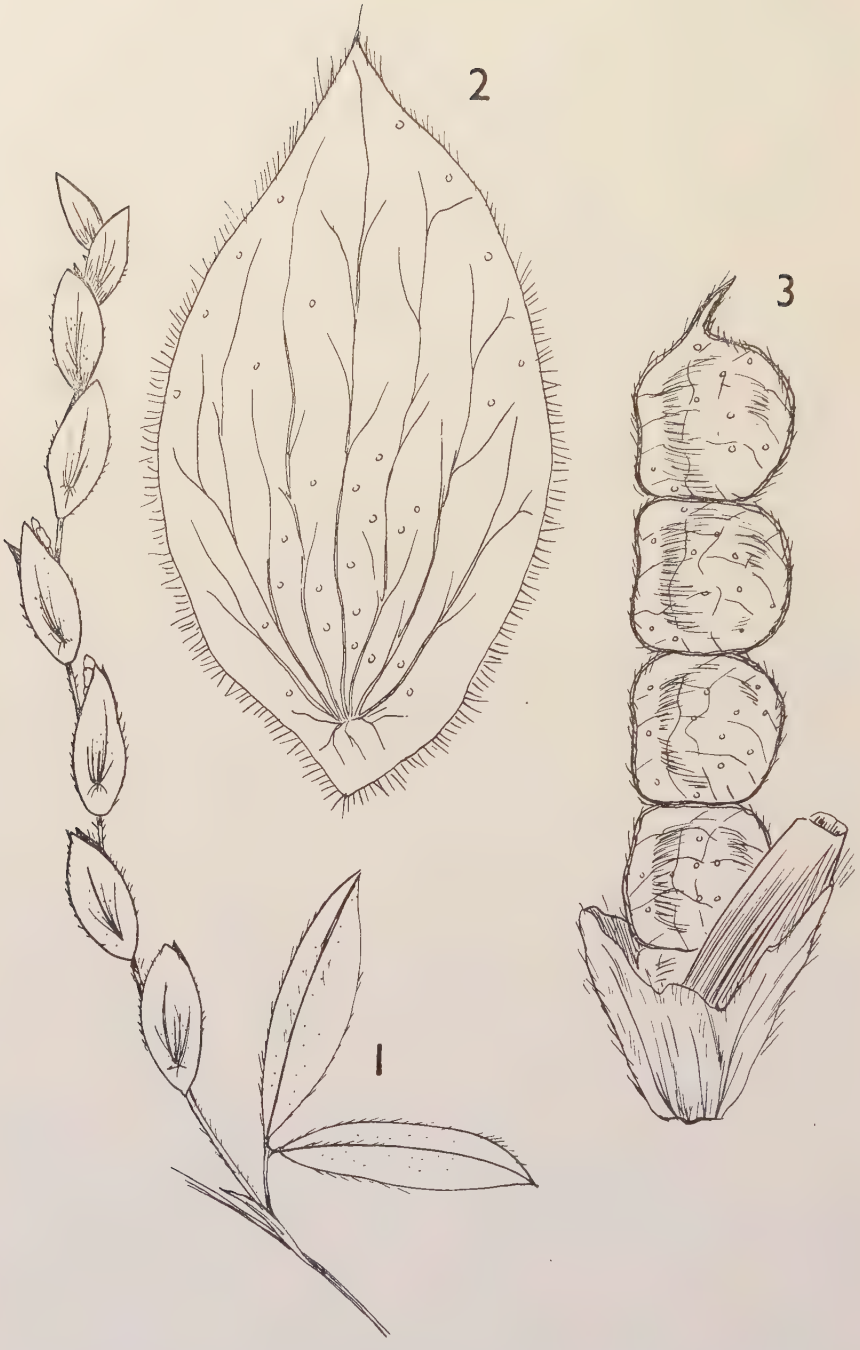

Fig. 2. *Zornia albolutescens*. 1, upper portion of plant showing inflorescence and leaves, × 2; 2, bract, × 10; 3, fruit, × 10. All from *Bogdan* 4023.

TYPE: Kenya, Machakos District, Makueni, *Bogdan* 4023 (K, holotype, FI, isotype).

KENYA. Makueni, 64 km. SE. of Machakos, 3500 ft. [1050 m.], *Bogdan* 4023 (K, holotype, FI, isotype).

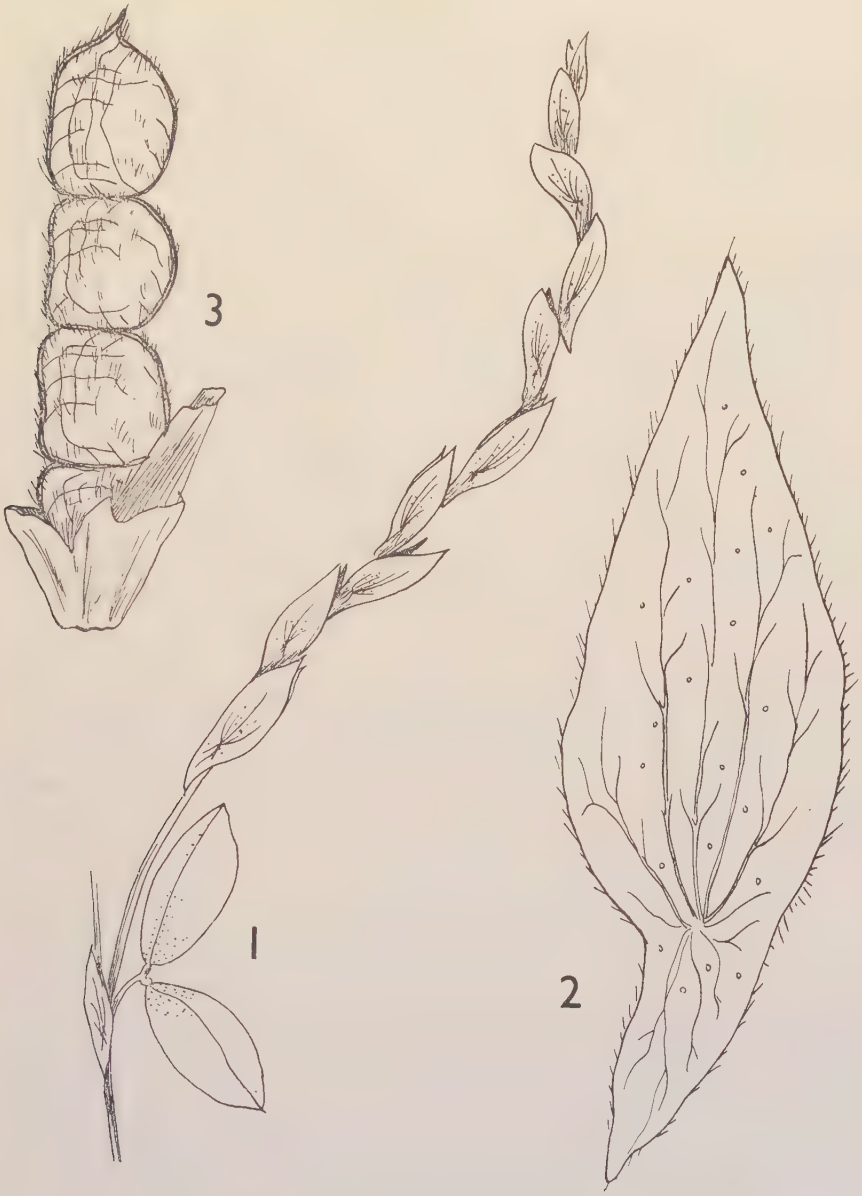

Fig. 3. *Zornia puberula*. 1, upper portion of plant showing inflorescence and leaves, × 2; 2, bract, × 10; 3, fruit, × 10. All from *Baron* 671.

This species is recognized by its striking whitish-yellow appearance. The glabrous, nearly bristleless, pale loments separate this species from all other binate-leaved species in Africa.

Known only from the type-collection, *Z. albolutescens* was collected by Mr. A. V. Bogdan of the Kenya Agricultural Department.

Zornia puberula *Mohlenbrock*, sp. nov.

Herba perennis, usque 25 cm. alta, caulibus ramosis glabris vel parce pilosis. *Foliola* 2, ovata, subacuta, usque 15 mm. longa, 8 mm. lata, epunctata, raro punctata, glabra, 1-nervata; petiolus quam foliola brevior, glaber; petiolulus glaber; stipulae acuminatae, usque 6 mm. longae, epunctatae, glabrae, 5–6-nervatae, infra basim in calcar usque 4 mm. longum productae. *Inflorescentia* apice subcongesta; bracteae ovato-lanceolatae, acutae, usque 9 mm. longae, 4 mm. latae punctatae, glabrae, ciliatae, 5–7-nervatae, infra basim in calcar usque 4 mm. longum productae. *Calycis lobi* postice alte connati, obtusi, circiter 4 mm. longi, parce strigosi, 7-nervati; lobus anticus acutus, circiter 3·5 mm. longus; lobi laterales acuti, circiter 3 mm. longi. *Corolla* lutea, vexillo usque 12 mm. longo, alis et carina falcatis. *Lomentum* 3–5-articulatum, articulis 1·7 mm. longis 1·6 mm. latis obscure reticulatis solide puberulis eglandulosis haud vel parce setiferis. Fig. 3, p. 329.

Type: Central Madagascar, *Baron* 671 (FI, holotype, K).

Madagascar. Central, *Baron* 671 (FI, K), *Parker* s.n. (K), *Blackburn* s.n. (K), *Humblot* 581 (K); Manandona Valley, *Scott Elliot* 2005 (K); Ambohitsi, *Hildebrandt* 3388a (K); Mont Itrafanaomby, *Humbert* 13470 (K).

This endemic in the island of Madagascar is distinguished by its usually bristleless, densely puberulent, small loments. *Scott Elliot* 2005 is exceptional in having loments which are reticulate and short bristly.

Reference

Milne-Redhead, E. (1954). *Zornia* in Tropical Africa, in Boletim da Sociedade Broteriana, sér. 2A, 28: 79–104.

Generic and specific names of fossil plants.*—The 40th, 41st and 42nd parts of this important catalogue of fossil plants include the genera and species of the *Filicales*, *Pteridospermae* and *Cycadales*, in alphabetical sequence from *Dicroidopsis* to *Heterofilicites*, together with their synonyms, references to literature and distribution. Their appearance will be welcomed not only by palaeobotanists but also by taxonomists engaged on the study of present-day plants, since genera such as *Dryopteris* Adanson, *Gymnogramme* Desv. and *Hemitelia* R. Br. include both fossil and living species.

C. E. Hubbard

**Fossilum Catalogus*: *II*: *Plantae*. Edited by †W. Jongmans. Vol. 15, parts 40–42 Filicales, Pteridospermae, Cycadales, Nos. 13–15, [compiled by] W. Jongmans and S. J. Dijkstra. Pp. 1039–1356. The Hague: Dr. W. Junk, 1960, Price No. 13, 27.00 guilders; No. 14, 27.50 guilders; No. 15, 26.50 guilders.

Notes on African *Araliaceae*: III*

J. R. Tennant

SCHEFFLERA BARTERI NOW IN EASTERN AFRICA

Schefflera barteri (*Seem.*) *Harms* in Engl. & Prantl, Pflanzenfam. III. 8: 38 (1894); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 520 (1928); Lebrun in Bull. Jard. Bot. Brux. 13: 21 (1934); Exell, Cat. Vasc. Pl. S. Tomé: 194 (1944); Hutch. & Dalz., Fl. W. Trop. Afr., ed. 2, 1: 751 (1958).

A survey of tropical African material of *Schefflera* has made possible the following list of synonyms of *S. barteri*. I believe *S. urostachya* Harms also to be conspecific, but on account of the generally shorter peduncles of its umbellules (the secondary branches of the inflorescence), I regard it as varietally distinct. All the specimens cited are in the Kew Herbarium, unless otherwise stated.

Key to the varieties

Secondary branches of inflorescence [peduncles of umbellules] (0·4–) 0·7–3·2 cm. long . . . . . var. **barteri**

Secondary branches of inflorescence [peduncles of umbellules] 0–0·6 (–0·7) cm. long . . . . . var. **urostachya**

var. **barteri**

Astropanax barteri Seem. in Journ. Bot. 3: 177 (1865). Type: Sierra Leone, Sugar Loaf Mt., *Barter* 2027 (K, holotype!).

Astropanax baikiei Seem. in Journ. Bot. 3: 177 (1865). Type: Nigeria, Brass, mouth of R. Niger, *Barter* 1851 (K, holotype!).

Sciadophyllum barteri (Seem.) Seem. in Journ. Bot. 3: 267 (1865) & Rev. Hed.: 51 (1868).

Sciadophyllum baikiei (Seem.) Seem. in Journ. Bot. 3: 267 (1865) & Rev. Hed.: 51 (1868).

Heptapleurum barteri (Seem.) Hiern in Fl. Trop. Afr. 3: 30 (1877).

Heptapleurum baikiei (Seem.) Hiern in Fl. Trop. Afr. 3: 30 (1877).

Schefflera baikiei (Seem.) Harms in Engl. & Prantl, Pflanzenfam. III, 8: 38 (1894); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 520 (1928).

? *Schefflera goetzenii* Harms in von Goetzen, Durch Afr.: 376 & 380 (1895); Engl., Pflanzenw Ost-Afr. A: 134 (1895); von Goetzen, Durch Afr. [reprint]: 7 (1896); Harms in Engl., Bot. Jahrb. 26: 242 (1899); Th. & Hél. Dur., Syll. Fl. Congo: 239 (1909); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Lebrun in Bull. Jard. Bot. Brux. 13: 22 (1934); Eggeling, Indig. Trees Uganda Prot.: 18 (1940); Robyns, Fl. Sperm. Parc Nat. Albert 1: 688 (1948); Eggeling, Indig. Trees Uganda Prot., ed. 2:35 (1952). Type: Congo Republic (ex Belgian), between Lakes Edward & Kivu, Kirunga [Virunga] Mts., *von Goetzen* 46 (B, holotype†).

*Continued from Kew Bull. 14: 309 (1960).

†Specimen now destroyed.

Schefflera stuhlmannii Harms in Engl., Bot. Jahrb. 26: 243 (1899); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Brenan, Check-lists Trees & Shrubs Brit. Emp., No. 5, pt. 2, Tanganyika Terr.: 61 (1949). Types: Tanganyika, Morogoro District, Uluguru Mts. *Stuhlmann* 8849 & Upper Mgata Valley, *Stuhlmann* 9277 (both B, syntypes†).

Heptapleurum dananense A. Chev. in Bull. Soc. Bot. Fr. 57, Mém. 8: 178 (1912). Type: Ivory Coast, Danané edge of tributary of R. Nuon, *Chevalier* 21275 (P, holotype; K, isotype).

? *Schefflera adolfi-friderici* Harms in Wiss. Ergebn. Deutsch. Zent.-Afr. Exped., 1907–1908, 2 (Bot.): 590 (1913); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Lebrun in Bull. Jard. Bot. Brux. 13: 21 (1934); Robyns, Fl. Sperm. Parc Nat. Albert 1: 688 (1948). Type: Ruanda, volcanic region of Bugoie, *Mildbraed* 1478 (B, holotype†).

? *Schefflera mildbraedii* Harms in Wiss. Ergebn. Deutsch. Zent.-Afr. Exped., 1907–1908, 2 (Bot): 591 (1913); Engl., Pflanzenw. Afr. 3(2): 779 (1921); Lebrun in Bull. Jard. Bot Brux. 13: 21 (1934); Robyns, Fl. Sperm. Parc Nat. Albert 1: 688 (1948). Type: Ruanda, Rugege Forest, Rukarara [stream], *Mildbraed* 1010 (B, holotype†).

? *Schefflera ledermannii* Harms in Engl., Bot. Jahrb. 53: 359 (1915); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Hutch. & Dalz., Fl. W. Trop. Afr. 1: 520 (1928). Types: Cameroun Republic, between Fossong & Dchang, *Ledermann* 1554 (B, syntype†) & Fernando Po, Moka in SE. of island, *Mildbraed* 7107 (B, syntype†).

Schefflera henriquesiana Henriques in Bol. Soc. Brot. 27: 192 (1917); Engl., Pflanzenw. Afr. 3(2): 778 (1921); Exell, Cat. Vasc. Pl. S. Tomé: 194 (1944). Types: S. Tomé, Vermelho, *Moller* 490 (COI, syntype; BM, isosyntype!) & Bate-pá, *Moller* 569 & 701 (Both COI, syntypes).

Schefflera tridentata De Wild. in Rev. Zool. Afr. 8, Suppl. Bot.: 13 (1920). Type: Congo Republic (ex Belgium), Angi, *Becquaert* 5790 (BR, holotype).

Schefflera dananensis (A. Chev.) Engl. in Engl., Pflanzenw. Afr. 3(2): 778 (1921).

Schefflera sycidiifolia Lebrun in Bull. Jard. Bot. Brux. 13: 19 (1934); Robyns, Fl. Sperm. Parc Nat. Albert 1: 687 (1948). Type: Congo Republic (ex Belgian), District of Lakes Edward & Kivu, between Kasindi and Lubango, *Lebrun* 4755 (BR, holotype; K, isotype).

Guinea Republic. Pita, (fl.) Apr. 1920, *Pobéguin* 2293.

Sierra Leone. Tunkia, Daru, at edge of marsh, (fr.) 8 Mar. 1945, *Deighton* 4115:—tree 4·5 m.; Mende name 'Nja-Gbamei'. Sugar Loaf Mt. (fl. & fr.) Apr. 27 1892, *Scott Elliot* 5828:—a tree.

Liberia. Ganta, in swamp-forest, (fr.) 3 Dec. 1939, *Harley* 1117:—woody vine 23 m. tall; diameter at breast height 25 cm.

Nigeria. Calabar Province, Eket district, about 8 km. from Eket on road to Ibeno, in fresh-water swamp-forest with *Cyrtosperma*, *Uapaca*, *Parkia bicolor*, *Macrolobium* and *Raphia*, (young fr.) 13 May 1953, *Onochie in F.H.I.* 32921:—stout climber with leaves and inflorescences crowded at the ends of the branchlets, stems and inflorescence-axes dark purple; bracts and pedicels the same colour; ovary green below, light on top; style and stigmas light cream. Oban, (fl. and young fr.), *Talbot* 1735.

Brit. Cameroons. Bamenda, in forest, 1800 m., (fr.) Apr. 1931, *Maitland* 1623:—tree.

Cameroun Republic. Bipinde, in primaeval forest, (fr.) *Zenker* 4848. Yaúnde-Station, 800 m. (fl.) *Zenker & Staudt* 162 & (fl. & young fr.) 762.

S. Tomé. 550 m. alt., (fl. & fr.) *Moller* 140.

Gaboon. Haute Ngounyé, (young fr.) collected between 1925–8 *Le Testu* 5462.

Congo Republic (ex Belgian). Kigali, (young fr.), *Renier Henri* 269. Yangambi, (young fr.), *Louis* 2222 & (mature fr.) 7 June 1938, *Louis* 9720. Eola, (fr.) 25 Aug. 1946, *Léonard* 393. Kivu, Virunga Mts., Nyamlagia Volcano, 2050 m., in forest, (fr.) Feb. 1932, *Lebrun* 4880:—lianiform bush; flowers yellow-greenish. Mountains W. of Lake Kivu, to the W. of Tshibinda, 2000–2400 m., in forest, (young fr.) Feb.–Mar. 1929, *Humbert* 7478.

Ruanda. Shangugu, Astrida-Bukavu road, km. 93, Rugege Forest, near Uwinka, mixed forest of *Podocarpus*, *Parinari*, *Carapa*, (young fr.) 24 Sept. 1956, *Troupin* 2615:—woody liane; flowers greenish, in racemes.

Uganda. Toro District, Ruwenzori, Namwamba Valley, (fl. & young fr.) 3 Jan. 1935, *G. Taylor* 2809 (BM).

Tanganyika. Lushoto District, W. Usambara Mts., Makuyuni, (fl.) *Koritschoner* 1559:—roots toxic; vernacular name 'Ngoroma". W. Usambara Mts., Mkusu Valley between Mkuzi and Kifungilo, 1600 m., in forest by riverside (fr.) 23 Apr. 1953, *Drummond & Hemsley* 2217:—small tree straggling through other trees overhanging river; in fruit only; fruits pale green; exudes a curry-powder smell when cut. E. Usambara Mts., Amani Chini, 870 m., locally common over trees in the more open parts of *Parinari excelsa-Newtonia buchananii-Cephalospheria usambarensis* evergreen rain-forest, (young fr.) 28 Sept. 1940, *Greenway* 6030:—a liane with palmately compound leaves and racemes of greenish-yellow umbellate flowers; roots cooked and the liquid drunk just before child-birth. E. Usambara Mts., Mlinga Peak, 960 m., rare in secondary forest of *Dracaena paphau*, *Bridelia micrantha*, *Parinari excelsa* and *Isoberlinia scheffleri* on steep mountain slope, (fr.) 18 Feb. 1937, *Greenway* 4896:—a liane with thick stems and green flowers. Morogoro District, Uluguru Mts., Bunduki Forest Reserve (fr.) Mar. 1953, *Paulo* 43:—a climber about 9 m.; fruits green. Salaza forest, about 5 km. S. of Bunduki, 2000 m. in hillside forest, (fr.) 15 Mar. 1953, *Drummond & Hemsley* 1618:—tree 10 m. in height; in fruit only; young fruits yellowish-green. Morningside, quite frequent, 1350 m., (fr.) 28 Nov. 1934, *Miss E. M. Bruce* 240:—small tree, 3 m. high; flowers greenish. Morogoro District, without precise locality, 1380 m., in forest (fl.) 18 Nov. 1932, *Wallace* 456:—small timber-tree, flower-buds green, with yellow stamens inside; Kiswahili name 'Mdondoro'. Songea District, Matengo Hills, Lupembe Hill, in upland rain-forest, 1890 m., (young fr.) 3 Mar. 1956, *Milne-Redhead & Taylor* 8962:—liane up to 15 m. high; leaves deep green, leathery, paler below with fine dark reticulations; nerves ± level on both surfaces; calyx and ovary green.

Southern Rhodesia. Vumba District, Vumba Motel, in forest, 1650 m., (young fr.) Mar. 1949, *Wild* 2837:—tree, 9 m. high. Umtali in mist-forest (fl.) 6 June 1948, *Chase* 766:—woody liane reaching to topmost branches of *Ficus* tree, 9 m.; flowers creamish-green. Melsetter District, Glencoe Forest Reserve, (young fr.) Apr. 1955, *Armitage* 79/55:—climber.

var. **urostachya** (*Harms*) *Tennant*, stat. et comb. nov. Type: Congo Republic (ex Belgian), Beni near Muera (high forest at edge of swamp) *Mildbraed* 2185 (B, holotype†).

Schefflera urostachya Harms in Wiss. Ergebn. Deutsch. Zent.-Afr. Exped., 1907–1908, 2 (Bot.): 591, tab. 78 (1913); Engl., Pflanzenw. Afr. 3(2): 779 (1921); Lebrun in Bull. Jard. Bot. Brux. 13: 22 (1934); Eggeling, Indig. Trees Uganda Prot.: 18 (1940); Robyns, Fl. Sperm. Parc Nat. Albert 1: 687 (1948); Brenan, Check-lists Trees & Shrubs Brit. Emp., No. 5, pt. 2, Tanganyika Terr.: 61 (1949); Eggeling, Indig. Trees Uganda Prot., ed. 2: 36 (1952). Type Congo Republic (ex Belgian), Beni, near Muera, in high forest at edge of swamp, *Mildbraed* 2185 (B, holotype†).

Schefflera tessmannii Harms in Engl., Bot. Jahrb. 53: 360 (1915); Engl., Pflanzenw. Afr. 3(2): 779 (1921). Type: Spanish Guinea, Nkolentangan, *Tessman* 344 (B, holotype; K, isotype).

Schefflera sp. in Check-lists Trees & Shrubs Brit. Emp., No. 1, Uganda: 24 (1935) quoad spec. *Maitland* 414, *Brown* 147, *A. S. Thomas* 926, *Dawe* 216, *For. Dep.* 410.

The excellent plate of *Schefflera urostachya* Harms (*l.c.*, *supra*) clearly portrays the very shortly pedunculate or subsessile umbellules characterising the present taxon.

Gabon. Cap Esterias, (fl.), *Klein* 56.

Congo Republic (ex Belgian). Kivu Province, Kalehe, route Kavumu-Walikale, near km. 110, Irangi, I.R.S.A.C. Reserve, Catena 2B, 600 m., in forest, (fl.) 24 May 1957, *Troupin* 3476:—plant of 1 m. high, flowers white.

Uganda. Toro District, Kibale Forest, Fort Portal, (fl.) Aug. 1936, *Eggeling* 3093:—a climbing shrub or epiphyte; leaves digitate; petiole long, clasping, green with purple streaks; leaflets 8; flowers yellow within, brown in the bud. Kigezi District, Kigezi, (fl.) Sept. 1936, *Eggeling* 3282:—liane; flowers yellow. Ishasha Gorge, 1200 m., in forest, (fl. & young fr.) Apr. 1946, *Purseglove* 2031:—woody liane to 30 m. or more; large palmate leaves; flattened inflorescence with radiating spikes of yellowish flowers. Masaka District, Lake Victoria, Nkose I., (fr.) 21 Jan. 1956, *Dawkins* 847:—twisted and leaning small tree with semi-climbing branches extending to 8 m. high by leaning on neighbouring trees; branchlets coarse and warty from leaf-scars, seldom less than 2 cm. diam.; bark thick, corky with dirty-white slash, soft and fibrous, rapidly oxidising to green and then brown; leaves crowded near branch apices; spikes terminal and strongly divergent forming pseudo-whorls, up to eight or ten per branch; spikes from 8 to 30 cm. long; flowers pale translucent; fruits turning through green to grape-purple when mature; collected from one individual; frequent, appearing both as a genuine liane and also making poor attempts to exist as a self-supporting tree. Sese Is., Bugala I., Toa, 1170 m., local in primary forest, (fr.) 2 Mar. 1933, *A. S. Thomas* 926:—large open shrub with 3 m. bare stems, leaves near tips of branches; vernacular name 'Lugogome'. Baninga I., 1110 m., in forest, (young fr.) Dec. 1922, *Maitland* 414:—yellow apical flowering spikes. Malabigambo Forest, 4 miles [about 6 km.] SSW. of Katera, 1150 m., in swamp-forest, (fr.) 3 Oct. 1953, *Drummond & Hemsley* 4609:—liane with thick woody stem; height 15 m.; leaflets coriaceous, yellow-green; fruits pale green, some with reddish flush. Mengo District, Busiro, 1170 m., (fr.) 1905, *Dawe* 216. Mile 10 [km. 16], Bombo road, 1155–1170 m., in forest, (fl. & young fr.) Jan. 1938, *Chandler* 2121:—tree 4·5–6 m. or more high; flowers greenish; sap has an unusual smell similar to some mangoes; leaf stems have some dark reddish-purple streaks from $\frac{1}{4}$ in. to $\frac{1}{2}$ in. long. Mawo-

kota, 1170 m. alt. (fl.) 1905, *E. Brown* 147. Entebbe, 1155 m., in lakeshore forest, (fr.) Feb. 1932, *Eggeling* 183 *in F.D.* 410:—small tree, partly climbing up others; bark corky on lower trunk or upper roots; leaves light green; flower spikes terminal, about 8 to an inflorescence, arranged at right-angles to the branchlet like the spokes of a wheel; fruits greenish.

TANGANYIKA. Bukoba District, Kaigi, Rubare Forest Reserve, (fl.) May 1935, *Gillman* 271.

Myrtaceous confusion in New Caledonia.—The genus *Cupheanthus* was described by Seemann (Fl. Vit.: 76 (1865) *in adnot.*) with the sole species *C. neo-caledonicus* Seem. It was described independently as *Gaslondia amphoricarpa* Vieill. in the following year (Vieill. in Bull. Soc. Linn. Normand. 10: 96 (1866)). Guillaumin, in his catalogue of the plants of New Caledonia (Ann. Mus. Colon. Marseille 19: 155 (1911); reimpr.: Cat. Pl. Phan. Nouv.-Caléd., Dialypét.: 83), by an unfortunate error listed the plant as '*C. austro-caledonica* Seem.'; and, still more unfortunately, he repeated this error in his subsequent keys to the genus (Bull. Soc. Bot. France 85: 651 (1939); Fl. anal. & synopt. Nouv.-Caléd., Phan.: 244 (1948)).

But E. G. Baker, in his treatment of the *Myrtaceae* for the account of Compton's New Caledonian plants (Journ. Linn. Soc., Bot. 45: 316–317 (1921)), increased the confusion yet further. He reduced *Cupheanthus* to sectional rank under *Eugenia*, and, in transferring *C. neo-caledonicus* Seem. to the latter genus, took up Guillaumin's erroneous '*austro-caledonica*' and published the supposed new combination *Eugenia austrocaledonica* Bak. fil., based upon the imaginary *Cupheanthus austro-caledonicus* 'Seem.', overlooking the fact that there already existed an *Eugenia austro-caledonica* of Seemann himself (Fl. Vit.: 76–77, *in adnot.*) [=*Syzygium austro-caledonicum* (Seem.) Guillaumin in Bull. Soc. Bot. France 85: 643 (1939)]. At the same time he described, as a new species of this same section, *Eugenia* (§ *Cupheanthus*) *neo-caledonica* Bak. fil., which Guillaumin (Bull. Soc. Bot. France, *l.c.*) then transferred to *Cupheanthus* as *C. neo-caledonicus* (Bak. fil.) Guillaumin—non Seemann!

This appalling confusion may be set out as follows. It necessitates a new name for one of the species involved.

Cupheanthus neo-caledonicus *Seem.*, Fl. Vit.: 76 (1865), *in adnot.*

Gaslondia amphoricarpa Vieill. in Bull. Soc. Linn. Normand. 10: 96 (1866).

Cupheanthus austro-caledonica [sic] 'Seem.' ex Guillaumin in Ann. Mus. Colon. Marseille 19: 155 (1911); reimpr.: Cat. Pl. Phan. Nouv.-Caléd., Dialypét.: 83 (1911); et ('*austro-caledonicus*') in Bull. Soc. Bot. France 85: 651 (1939), *in clavi*; et Fl. anal. & synopt. Nouv.-Caléd., Phan.: 244 (1948); Bak. fil. in Journ. Linn. Soc. Lond., Bot. 45: 316 (1921), *in clavi*, *pro syn.* ('*austrocaledonicus*'); sphalm. pro *C. neo-caledonicus* Seem.

Eugenia (§ *Cupheanthus*) *austro-caledonica* Bak. fil. in Journ. Linn. Soc. Lond., Bot., *l.c.*, *in clavi* (1921); non *E. austro-caledonica* Seem. (1865).

NEW CALEDONIA. Sine loc. exact., *W. Anderson.*

Cupheanthus serpentini *Airy Shaw*, nom. nov.

Eugenia (§ *Cupheanthus*) *neo-caledonica* Bak. fil. in Journ. Linn. Soc. Lond., Bot., *l.c.* 317 (1921); non *Cupheanthus neo-caledonicus* Seem.

Cupheanthus neo-caledonicus (Bak. fil.) Guillaumin in Bull. Soc. Bot. France, *l.c. supra* (1939); non *C. neo-caledonicus* Seem. (1865).

New Caledonia. Cap Bocage; moist forest; serpentine; sea-level; *Compton* 1369.

Syzygium austro-caledonicum (*Seem.*) *Guillaumin* in Bull. Soc. Bot. France 85: 643 (1939); Fl. anal. & synopt. Nouv.-Caléd., Phan.: 246 (1948).

Eugenia austro-caledonica Seem. Fl. Vit.: 76 (1865), *in adnot.*; Guillaumin in Ann. Mus. Colon. Marseille 19: 151 (1911); reimpr.: Cat. Pl. Phan. Nouv.-Caléd., Dialypét.: 83 (1911).

New Caledonia. Sine loc. exact., *Sir J. E. Home.*

H. K. Airy Shaw

One third completed.*—With the publication of Part XIII of Miss Ross-Craig's 'Drawings of British Plants', (completing the *Umbelliferae* and including the small *Araliaceae* and *Cornaceae*) volume IV of the series is now completed. Drawings of about one third of the British flora have now been published in the last twelve years. One hopes that the remaining volumes can now be completed at a greater rate than this although it must be realised that the enormous labour involved in the drawing, and the excellent standard of reproduction probably do not permit of this.

Herbarium and living specimens of *Umbelliferae* have not always the necessary fruit present for their critical identification, and details of the leaf shape and mode of branching of the lobes have generally been only briefly mentioned in floras. However it has lately been realised that leaf characters can be almost as important taxonomically as fruit characters, and Miss Ross-Craig, in portraying in such accurate detail both fruits and leaves, gives us fewer excuses for being unable to determine British *Umbelliferae* when presented with rather scanty or immature material.

Although not detracting from the merit of the book, the nomenclature of the species leaves a little to be desired in a few cases. For example, *Petroselinum crispum* should be followed by '(Mill.) Nyman ex A. W. Hill' and the earliest name for *Bupleurum opacum* (Ces.) Lange is *B. baldense* Turra.

It is with pleasure that one awaits the publication of the remaining thousand or so drawings in the not so very distant future.

P. F. Hunt

* *Drawings of British Plants*, Part XIII, Umbelliferae (2), Araliaceae, Cornaceae. By Stella Ross-Craig. 30 black & white plates. London: G. Bell & Sons Ltd., 1959. Price 9s. 6d.